WAY TRACK and STRUCTURES

PERHAPS YOU CAN TELL ME...

Should a man retire when he has been on the job for 50 years?

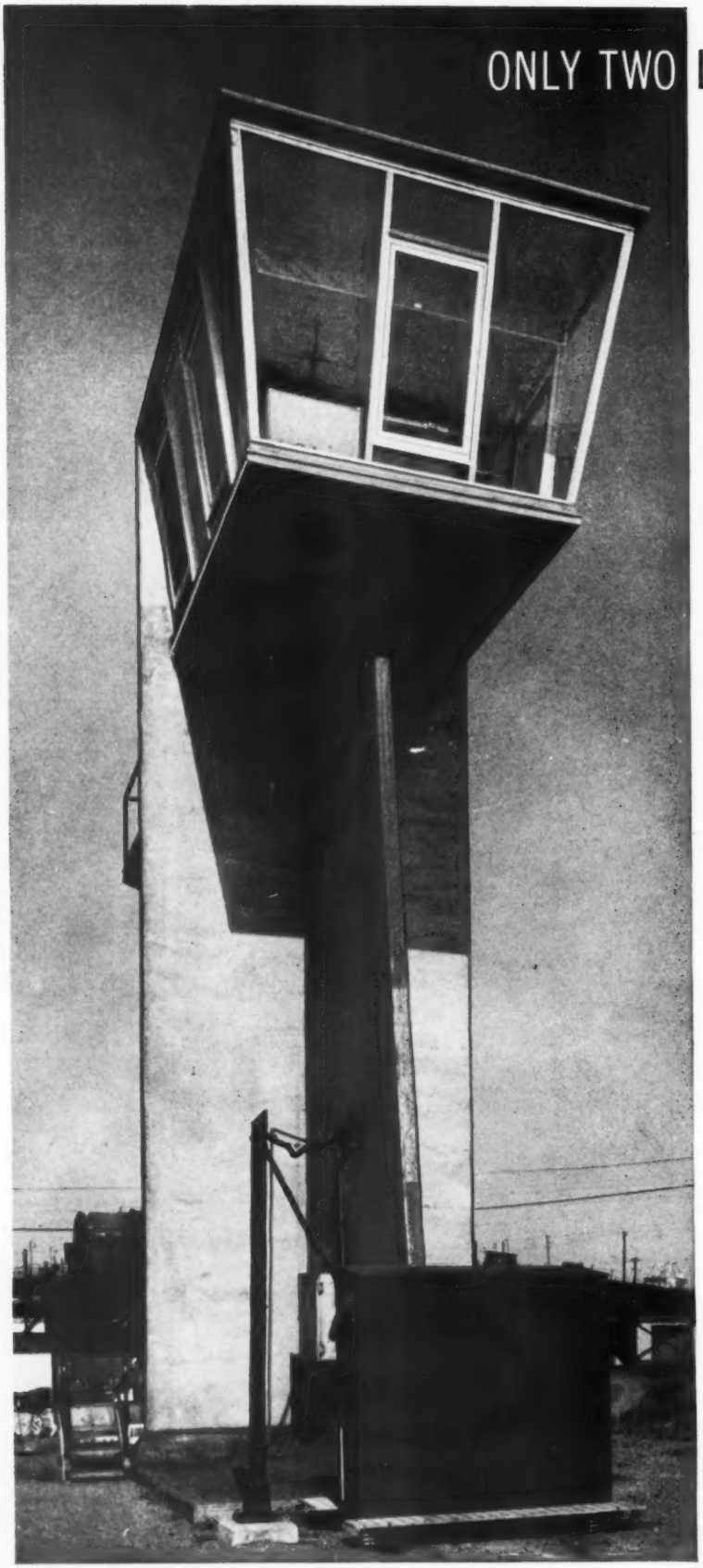
In my business life I have never had a dull moment, but there have been plenty of problems and challenges. I enjoy my work immensely. Lunch with my associates is an occasion. I have had the reward of seeing the business enlarge 125 times over the years.

My feeling is that a man who does not have to retire, and who thrives on his work, might better remain on the job — wear out rather than rust out. AM I RIGHT?

Chas. H. Reade, President

Railroads need weed killing service more than ever

READE MANUFACTURING COMPANY, INC., Jersey City 2, N. J.



ONLY TWO DAYS TO PUT UP...

C&O'S NEW PRESTRESSED CONCRETE TOWER

Chesapeake and Ohio built this retarder tower with precast, prestressed concrete. A foreman and 4 men with a 25-ton crane put it up without interfering with track operations.

This structure will stay modern looking and last for many years, even under corrosive yard conditions. And except for washing the windows there's practically no maintenance! All conduits for the service leads were cast right in the pylon slabs. This tower is another example of how progressive railroads are using concrete to build for economy . . . for durability . . . for efficient operation.

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete

FOR STRUCTURES...
MODERN
concrete

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RAILWAY
TRACK and STRUCTURES

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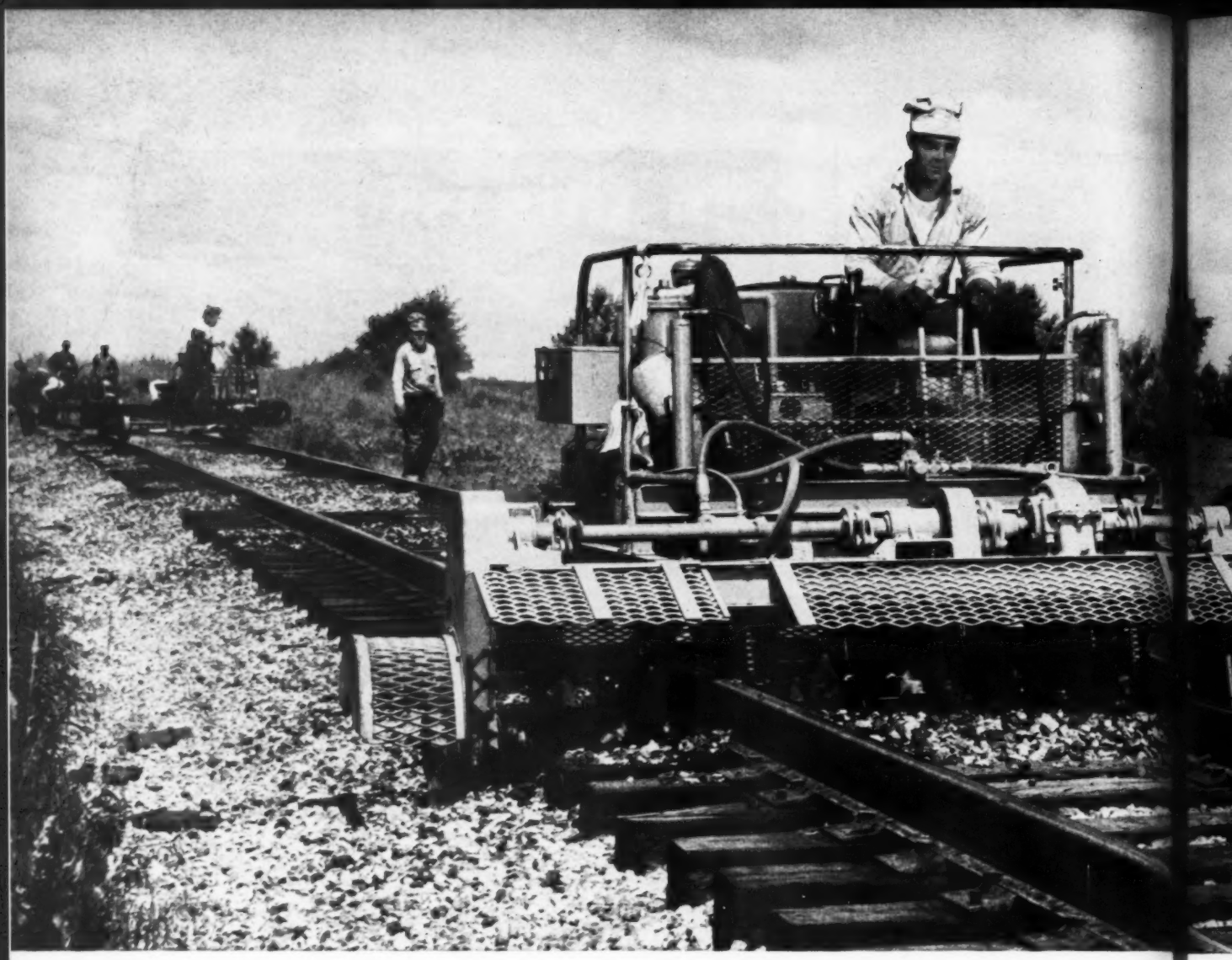
in this issue:

vol. 54, no. 10 OCTOBER, 1958

DON'T MISS . . .

In the recent construction of a branch line 15.5 miles long the Great Northern laid the track in preassembled panels. Here's why: A crew of six men, working in two 8-hr shifts, was able to place about 6,000 ft of track per day. Panels were complete, including joints.

. . . in the November issue

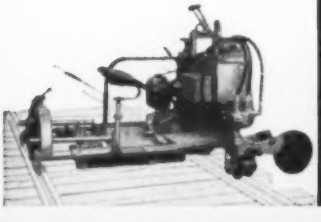


FAIRMONT

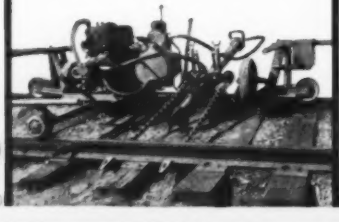
One man can do the work of fifteen

THE FAIRMONT W87 SERIES B TIE-BED SCARIFIER shown above can dig a tie-bed ten feet long to a predetermined depth in a minute or less . . . up to 800 hard, dry tie-beds a day! One man does the work of fifteen—and does it faster, better and at lower cost. What's more, ties go in straight and properly spaced. Ruggedized construction assures years of trouble-free, dependable operation. These are but a few of the reasons why cost records everywhere show the W87 paying for itself—and even earning dividends—in just a few months of operation. Why not equip *your* tie gangs with the Fairmont W87 Series B Tie-Bed Scarifier? It will save you money!

W90 SERIES A TIE HANDLER inserts or removes ties quickly and requires only two men for operation. Self-propelled.

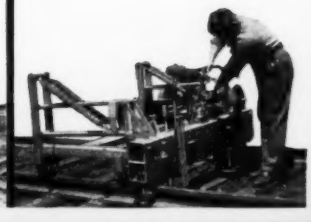


W68 SERIES A HYDRAULIC TIE REMOVER pushes out old ties at an average rate of approximately one per minute. Two-man operation.



W84 SERIES B HYDRAULIC SPIKE PULLER is primarily for use in tie gangs. Will pull from either rail without changeover.

W86 SERIES B HYDRAULIC RAIL LIFTER makes the job of removing or inserting tie plates a quick and easy one.



Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

STANDARD FASTENERS. A new 16-page booklet entitled "Helpful Hints" is a concise compilation of technical facts on applying standard fasteners. An important feature of the booklet is the inclusion of curves for both safe load and torque for various diameters and grades of bolts. Other information presented is the selection of the right grade of bolt, bolt stresses, calculation of proper bolt loading, tightening limitations, safety factor, threads, and protective coatings. Information on nuts and tapping screws is included. (Write: *Russell, Burdsall & Ward Bolt & Nut Co., Dept. RTS, 101 Midland Ave., Port Chester, N. Y.*)

TRUSSED RAFTER DESIGNS. A new series of clear-span roof-truss designs is now available to designers and builders. They were prepared to assist those who plan and build trussed rafters in areas where building codes restrict truss spacing to 16 in on centers. The new series, No. 677, is adaptable for roof spans from 20 ft to 32 ft and roof slopes from 4 in. in 12 in. to 7 in. in 12 in. Typical design information is given to guide architects and engineers. (Write: *Timber Engineering Company, Dept. RTS, 1319 18th St., N. W., Washington 6, D. C.*)

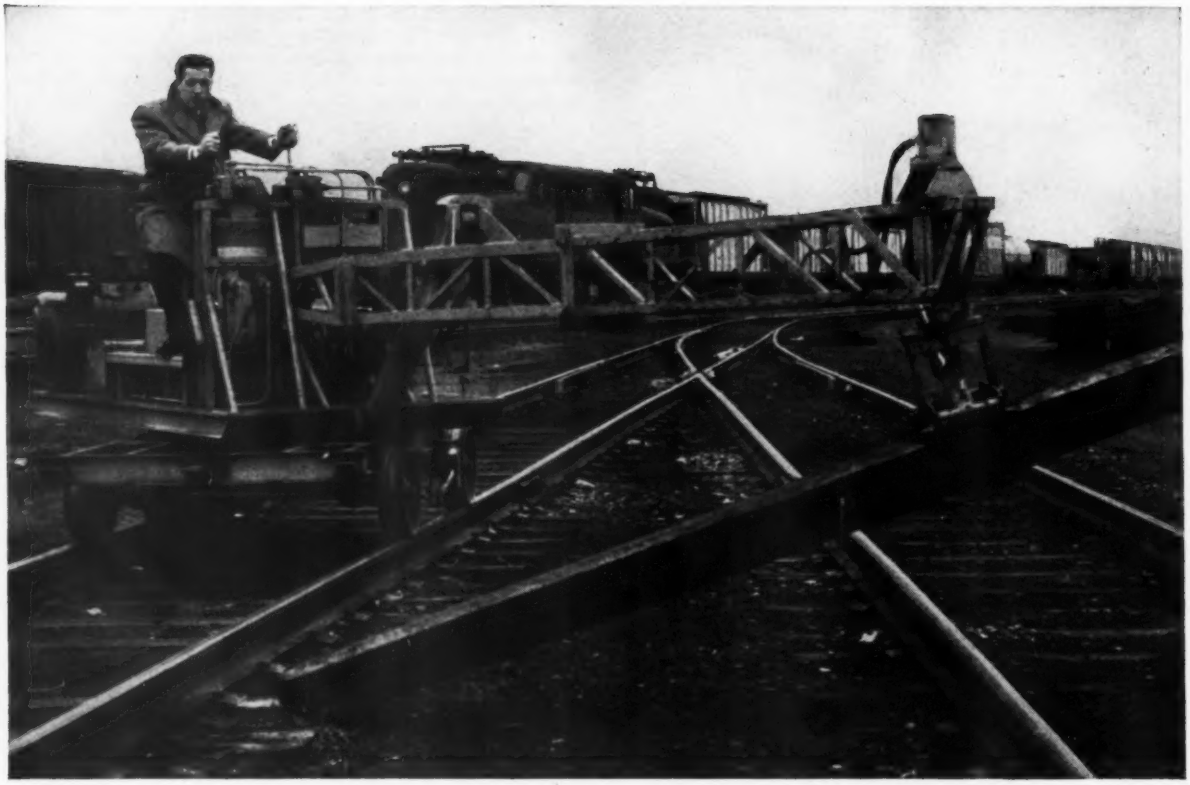
POWDER LANCE. A new 4-page folder entitled "Introducing the New Oxweld ACL-3 Powder Lance" is available describing a new tool capable of slicing through concrete or metal of any thickness. The booklet, Form 1153, outlines the origin, principle and scope of the process. It also describes cost-saving applications on construction and demolition jobs and gives complete specifications and ordering information for the lance and accessories. (Write: *Linde Company, Division of Union Carbide Corporation, Dept. RTS, 30 East 42nd St., New York 17, N. Y.*)

DROP TABLES. A booklet describing a new line of "Shaw-Box" hydraulic drop tables has recently been made available. Bulletin No. 15000-2-58 shows by drawings and on-the-scene photographs how the 70-ton model for handling four-wheel diesel locomotive trucks and the 100-ton model for handling six wheel trucks cuts "down-time" to a minimum and eliminates the need for a pit. Other types of drop tables are shown and there is a brief résumé of the manufacturer's line of materials handling equipment. (Write: *Manning, Maxwell & Moore, Inc., Shaw-Box Crane & Hoist Division, Dept. RTS, Muskegon, Mich.*)

SNOW THROWERS. Literature is available describing the manufacturer's full line of power snow throwers. Described are the Champion, a heavy-duty, self-propelled machine that clears snow at a rate of 520 shovelsful per minute; the Jari Junior, a lighter, self-propelled unit; and the Northland Sno-Thro, a low-cost, push-type snow thrower that has a field tested rotary snowthrower assembly which will handle 300 shovelsful per minute. It is explained that all models feature Jari's special open chute design which prevents clogging in packed or sticky snow. (Write: *Jari Products Inc., Dept. RTS, 2990 Pillsbury Ave., Minneapolis 8, Minn.*)

OIL FILTERS. An 8-page booklet entitled "Not an Element of Doubt" is available containing cost study information coupled with recommendations for extending oil change periods. The two-color booklet, form number DE839, also gives helpful service tips on filter replacement. Cutaway photographs show the inner parts of filter elements and point out their design characteristics. The importance of proper fit, temperature stability and rate of oil flow are discussed. (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS, Peoria, Ill.*)

UTILITY TRACTORS. A pictorial review of the Allis-Chalmers D-Series utility tractor line is now available. The new three-fold catalogue, UT-103, illustrates the tractors and companion equipment in action. Engineering, design and construction features are pictured. Specifications and dimensions are included for the D-14 and D-17 tractors. (Write: *Allis-Chalmers Manufacturing Company, Tractor Group, Dept. RTS, Milwaukee, Wis.*)



NEW RTW TIE HANDLER PLACES TIES FASTER . . .
WITH LESS COST AND EFFORT

With the new RTW Tie Handler, an experienced operator can position as many as 2 to 3 ties per minute . . . approximately 1000 ties in a working day! The RTW Tie Handler simplifies the placing of cross ties, eliminates the labor and danger of manual arrangement, minimizes the cost. You can also use it for piling old ties to be destroyed, or stacking usable ties to be banded and shipped to other locations. It is possible to use the above equipment for setting off light equipment in tie renewal gangs or loading on to push trucks for transporting when working on inside tracks. This machine is equally as effective for handling bridge timbers for maintenance programs.

In keeping with the trend of present developments in modern machines, the RTW Tie Handler is completely hydraulic in operation. Its simple, rugged design keeps maintenance to a minimum, permits additional savings in operational costs. RTW Tie Handlers are designed and engineered by specialists in track maintenance equipment. Write today for complete details.

SPECIFICATIONS FOR 57-BP TIE HANDLER

POWER PLANT: 4 cylinder air cooled gasoline engine—electric starter.

POWER TRANSMISSION: Hydraulic.

TRAVEL SPEED: 7½ to 15 M.P.H.

TRANSMISSION: 2-speed selective type.

ROTATING DECK: 360°.

TONGS: Rotate 260°.

TONG OPENING RANGE: 5" to 16-½".

BOOM: Box type—15' standard length.

BOOM: 5' intermediate section—optional—Extra charge.

BOOM: Travel—60° with boom parallel to track, 30° in either direction, up or down.

TRANSVERSE SET-OFF WHEELS: Optional—Extra charge.

CLEARANCE: Height—72". Width—65".

SWING: 6'2" (measured from center pin).

WHEEL BASE: 60".

OVERALL LENGTH: 10'8".

WEIGHT: Approximately 7000 lbs.

Railway Track-work Co.

3207 Kensington Ave., Philadelphia 34, Pa.

TRACK MAINTENANCE MACHINERY

Switch Grinders • Cross Grinders • Surface Grinders • Rail Drills • Cross Cutters • Bit Sharpeners • Tie Nippers • Grinding Wheels • Tie Handlers • Track Liners

NOW... SAVE UP TO 13,000 SPIKES PER MILE

... reduce tie splitting from excessive spiking

GAGE LOCK SPIKES

Two Gage Lock Spikes to a plate do a better holding job than 4 cut spikes on tangents and light curves. Fewer spikes are driven — causing less tie damage and permitting a saving of nearly 13,000 spikes per mile. The Gage Lock Spike is a plate fastening as well as a rail spike. It has an indented throat, offset at the tie plate surface. Result: thrust and wear are avoided from the edge of the rail base.

TIE PLATE LOCK SPIKES

Both the Tie Plate Lock Spike and the Gage Lock Spike hold the rail to gage and avoid plate cutting. When driven to refusal, the spread shank is compressed and binds against the walls of the hole with spring pressure. Play is eliminated — plates are held against movement — rail is held to gage and plate cutting is avoided.

RAIL LOCK SPIKES

Rail Lock Spikes offer the same design as Gage Lock Spikes, but are not offset at the plate surface. The throat protrudes 1/16"—resultant pressure binds the spike against the rail base edge. Play is eliminated between the tie plate shoulders — the rail is held to a true gage.

Forward-looking management can extend the cycle of track structure by using Lock Spikes. One regaging operation costs more than the initial cost of installing Lock Spikes. Specify spikes having a low annual cost—Specify Lock Spikes.

GAGE LOCK SPIKE

TIE PLATE LOCK SPIKE

BERNUTH, LEMBCKE CO., INC.

420 LEXINGTON AVENUE, NEW YORK 17, N.Y.

News about people

ATLANTIC COAST LINE — M. L. Horton, superintendent and formerly general roadmaster, retired after 33 years of service with this company.

BOSTON & MAINE—Foster R. Spofford, assistant chief engineer, has been appointed chief engineer, with headquarters at Boston, Mass., according to an announcement by **Stanley G. Phillips,** vice-president-engineering.

Charles H. Bowker, project engineer, has been promoted to office engineer with headquarters at Boston, succeeding **Harry A. Raymond,** retired.

BURLINGTON — Harry G. Porter, engineer of capital expenditures at Chicago, retired on August 31 after 41 years of service with this company.

CANADIAN NATIONAL — George M. Richards, has been appointed roadmaster on the western sections of the Prince Edward Island division.

ERIE — Patrick F. Nichols, assistant engineer on the Western district at Marion, Ohio, retired August 31.

MISSOURI PACIFIC — W. H. Shideler, track supervisor at Hope, Ark., has been promoted to assistant division engineer, Louisiana division, at Monroe, La., succeeding **J. E. Martin** who has been promoted to division engineer, Kansas City Terminal division. Mr. Martin succeeds **P. D. Tracy** who has been transferred to the Eastern division, with headquarters remaining at Kansas City. He succeeds **L. L. Wallis** who has been appointed general roadmaster — construction and assigned to the supervision of track construction in the hump yard being built at Kansas City, Mo.

NEW YORK CENTRAL — William A. Marx is appointed office engineer on the Western District with headquarters at Cleveland, Ohio, succeeding **R. L. Teeter,** promoted.

NICKEL PLATE — Robert C. Turnbell, assistant engineer at Cleveland, has been promoted to division engineer of the Ft. Wayne-Chicago divisions, with headquarters at Ft. Wayne, Ind. Mr. Turnbell succeeds **David J. White,** who has been transferred to the Wheeling & Lake Erie district, with headquarters at Brewster, Ohio. Mr. White replaces **Floyd A. Poling,** deceased.

J. W. DeMoyer, Jr.
Reading

Archer P. Crosley
Reading

NORFOLK & WESTERN — John B. Anderson, assistant roadmaster at Bluefield, Va., has been appointed assistant engineer at Roanoke, Va., succeeding **Harold W. Walbright,** promoted to crossing engineer. Mr. Walbright succeeds **Henry E. Dearing** who has been promoted to assistant engineer of bridges in the place of **H. C. Charlton,** deceased. **John E. Tankersley,** transitman, has been named resident engineer at Roanoke, succeeding **J. P. Maloney,** retired.

READING — John W. DeMoyer, Jr., assistant engineer, maintenance of way, has been named assistant chief engineer — maintenance in the place of **Archer P. Crosley,** engineer, maintenance of way, who is retiring after 41 years of service with this company. Coincident with Mr. Crosley's retirement, the responsibility over construction and maintenance of roadway and track is transferred from the operating department to the chief engineer.

SOUTHERN — Joel W. DeValle, assistant engineer of bridges at Knoxville, Tenn. has been promoted to engineer of bridges — system with headquarters at Washington, D.C. **Alvie W. Wright,** assistant track supervisor at Athens, Tenn., has been promoted to track supervisor at Greenville, Tenn. **James N. Tames,** assistant track supervisor on the St. Louis-Louisville district has been transferred to Wilton, Ala., succeeding **Billy W. Smith,** who has been transferred to New Albany, Ind.

VIRGINIAN — G. M. Cornell, assistant to president, has been promoted to chief engineer with headquarters as before at Norfolk, Va., succeeding **L. A. Gillett,** who retired on September 1. Mr. Cornell's former position of assistant to president has been abolished and the previous duties connected with this position will now be handled by the personnel manager.

Obituary

Armstrong Chinn, president of the Terminal Railroad Association of St. Louis, and formerly chief engineer of the Alton (now part of the Gulf Mobile & Ohio), died suddenly on August 28.

D. E. Perrine, assistant chief engineer, Chicago & Western Indiana—Belt Railway of Chicago, died on September 21.

Biographical briefs

Thomas L. Biggar, 49, who was recently appointed general supervisor track on the Chesapeake & Ohio at Richmond, Va. (*RT&S,* Aug., p. 10), began railroading in May 1925 with the C&O. In 1931 he was appointed assistant foreman of the Cincinnati division. He was named assistant signalman on the system construction force in 1936, and in 1938 was appointed assistant foreman on the system rail laying force. In 1939 he was promoted to foreman on the Cincinnati division. He was named assistant cost engineer at Covington, Ky. in 1945 and in 1952 he was appointed supervisor track at the same location, the position he held at the time of his recent promotion.

Henry E. Dearing, who has been appointed assistant engineer of bridges on the Norfolk & Western (announced elsewhere in this issue), is a graduate of the Virginia Polytechnic Institute. He entered the service of the Norfolk & Western on October 1947 as a chairman. He was promoted to draftsman in 1953 after serving as rodman and inspector. He was further advanced to crossing engineer in 1956 which position he held until his recent promotion.

Joel W. DeValle, who has recently been appointed engineer of bridges — system on the Southern at Washington, D. C., (announced elsewhere in this issue), was born at Ellisville, Miss. He entered service on the Southern in August 1937 as a section laborer at Slidell, La. In February 1947 he was appointed assistant engineer at Knoxville, Tenn., and since September 1954 has been assistant engineer of bridges.

Harry G. Porter, who has retired as engineer of capital expenditures of the Burlington at Chicago (announced elsewhere in this issue), started his railroad career in 1917 as a computer in the valuation section of the engineering department of the Burlington at Chicago. He was advanced to office engineer of the capital expenditures department in 1923. He served in that capacity until his appointment as engineer of capital expenditures in 1956, remaining in that position until his recent retirement.

Alexander Matthews, Jr., 44, who was recently appointed assistant district engineer on the New York Central at Cleveland, Ohio (*RT&S,* Aug., p. 10), obtained his higher education from Yale University and Brooklyn Polytechnic Institute and entered railroad service in July 1935 with the Long Island Railroad. In 1936 he joined the engineering corps of the NYC on its Eastern division. After serving with the 733rd Railway Operating Battalion of the U.S. Army from 1941 until 1945, he returned to the NYC in 1946 as assistant supervisor of track at Lyons, N. Y. In 1949 he was promoted to transportation assistant to vice-president and in 1950 he was named trainmaster at Watertown, N. Y. In 1953 he was promoted to transportation and economic research analyst, and in 1957 he was appointed staff engineer in the office of the assistant vice-president-engineering, the position he held at the time of his recent promotion.

(*Continued on page* 62)

Now... controlling vegetation is easier-cheaper-

with **UREABOR®** weed and grass killer

UREABOR can prove to be your most practical way of keeping any area weed-free! It offers all the features you want in a weed killer... convenience, safety, economy, and lasting effectiveness. With this granular dust-free material, one easy application—dry—at low rates of 1 to 2 lbs. per 100 sq. ft. gives you full season control.

UREABOR is a specially compounded formulation of sodium borates and substituted urea. It is a highly efficient weed killer that is nonflammable, noncorrosive to ferrous metal, and nonpoisonous when used as directed. It is always ready for use; there is nothing to mix—no water to haul.

UREABOR can be applied to small areas by hand. For treating larger areas, special spreaders in hand-operated and power-driven models are available.

UREABOR can protect your timber structures, yards, signals, and buildings from fire-hazardous weeds easier and cheaper than any other way we know. Write for more information.

UNITED STATES BORAX & CHEMICAL CORPORATION

Pacific Coast Borax Company Division

630 SHATTO PLACE • LOS ANGELES 5, CALIFORNIA

Control of vegetation for a full year in areas such as this can now be accomplished for as little as 30¢ per 100 sq. ft.

Dear reader:

RAILWAY TRACK and STRUCTURES

The machine—dictator of M/W policy

A convention is a good place to find out what maintenance men are thinking. Take the Roadmasters' and B&B conventions, for example. There you will find maintenance-of-way officers from all over the country. From conversations with them it is usually possible to conclude that certain clear-cut trends are developing or that events are pointing in a given direction.

But this year it was different. In private conversations there seemed to be unanimity of opinion on only one point—the need for reducing M/W costs. When the discussion got around to the general procedure to be followed in accomplishing this end it was apparent that very few roads are thinking along the same lines. In fact, after talking with numerous maintenance men at the recent conventions one is led to the conclusion that there is greater diversity of opinion now than at any time in recent years.

The gist of a conversation between track men from three different roads will illustrate the point. One of the roads represented has adopted the cycle method of making tie renewals. In other words, when renewing ties it takes out all ties that are judged not to have enough life left to last the length of the cycle. Another of the roads represented hasn't gone to the cycle method because it isn't convinced there is true economy in removing ties that are still suitable for main-line service.

The third road has resolved this problem to its satisfaction but obviously not to that of the others taking part in the conversation. This line uses the cycle method but it takes out only those ties that won't last a year. The bad ties are left in track until the end of the cycle period.

When we analyze this conversation we find that the use of machinery is playing an important role in shaping the thinking of M/W men today. Machines, and combinations of machines, are now available for removing and inserting ties at great savings in cost compared with hand labor. But the maximum savings from the use of this equipment are realized only when tie renewals are relatively heavy. That's the primary reason behind the cycle method. The trouble is that this method runs afoul of traditional thinking regarding when ties should be renewed. And therein, we suspect, lies a major reason for the wide differences of opinion that exist today regarding how tie renewals and other types of maintenance work should be carried out.

The rapid—and continuing—development of machines for maintenance work has posed a difficult problem. Effective use of this equipment involves a great deal more than merely substituting machines for men. It involves changes in basic concepts. An organization, for example, that worked well when hand labor was used more less exclusively may be entirely unsuitable for the efficient use of machines.

The fact is that the machine is now the master. Maintenance men must adapt their ways to the machine if they are to realize its maximum potential. As acceptance of this truth grows it is logical to expect that more maintenance officers will begin thinking along parallel—rather than diverse—lines.

MHD

The USS Solid Manganese Steel Self-Guarded Frog—

improves performance . . . minimizes maintenance . . . proves economical

The USS Self-Guarded Frog incorporates raised guards which have been cast integrally with the frog body. The guards guide the wheels past the frog point, eliminating the need for separate guardrails in the track opposite the frog. Therefore, a self-guarded frog is more economical than any other comparable frog that requires separate guardrails.

Cast in one piece from tough manganese steel, USS Self-Guarded Frogs are virtually maintenance-free, requiring no periodic body bolt tightening as do bolted rigid or railbound frogs and their guardrails. When used in freight classifying yards, terminals, and industrial yards, USS Solid Manganese Steel Self-Guarded Frogs will give many years of dependable service under rugged conditions. Hook twin frog plates shown under the frog are also a specialty of United States Steel.

For complete data, photographs, and diagrams on the full line of USS Trackwork products, send for the free catalog, "USS TRACKWORK." Address your request to United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pa. Also, you are invited to contact our engineers at any time for assistance in design.

United States Steel Corporation, Pittsburgh
Columbia-Geneva Steel, San Francisco
Tennessee Coal & Iron, Fairfield, Ala.
United States Steel Export Company

USS United States Steel

MONOTUBE PILE DATA

TYPE PILE—YN
UNSUPPORTED LENGTH—10 feet
BUTT DIAMETER—16 inches
GAUGE—#7
DESIGN LOAD—50 tons
OWNER: Commonwealth of Massachusetts
ENGINEERS: Bridge Dept., Mass. Dept. of Public Works
GENERAL CONTRACTOR: Campanella & Cardi Construction Co., Hillsgrove, R. I.
PILE DRIVING CONTRACTOR: C. L. Guild Construction Co., Inc., East Providence, R. I.

STRENGTH *plus* VERSATILITY with Monotube piles . . . a perfect combination for this bridge on the Mid-Cape Highway, Dennis, Mass. *Acting as columns*, as well as foundations, Monotube steel piles provide necessary strength, eliminate column form-work and add to architectural beauty.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL
Monotube Foundation Piles

News notes...

. . . a résumé of current events throughout the railroad world

A uniform "fringe benefit" move has been launched by all standard railway labor organizations, except the Engineers and Conductors. Demands were served September 10 on most roads, proposing a revised time limit rule on grievances, establishment of new rules governing hiring, new conditions of safety and sanitation, and a supplemental program of accident benefits. This appears to be an interim matter, which the unions reportedly want to have out of the way by next year, when the wage-rule change moratorium expires.

•

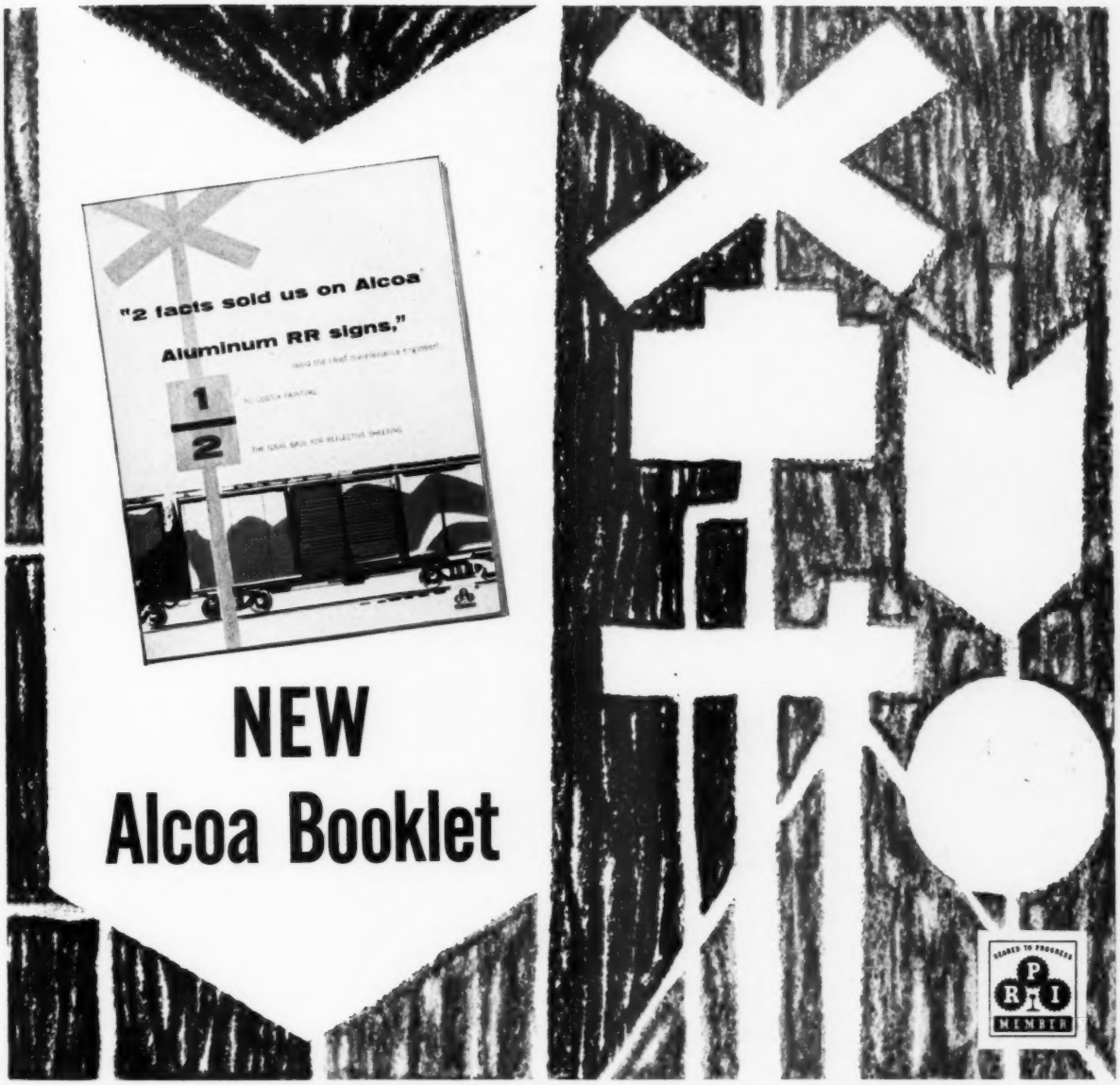
A gloomy picture of the future of railroad passenger transportation is contained in a report prepared by Howard Hosmer, Interstate Commerce Commission examiner. The report climaxed a year-long inquiry into the railroad passenger service deficit. His conclusion: "If railroad passenger-miles (other than in commutation) continue to decline at the average rate of reduction between 1947 and 1957, the parlor and sleeping car service will have disappeared by 1965 and the coach service by 1970." Reduction in passenger-train operation seems inevitable, according to Examiner Hosmer, because "none of the suggested means of reducing the deficit, such as revision of labor agreements, lower taxes, discontinuance of subsidies for motor and air transportation, and more revenue from mail can be considered promising."

•

A sweeping probe of the effects of featherbedding on the transportation industry was proposed by President James M. Symes of the Pennsylvania in a recent address. He suggested that a commission be set up to "investigate the extent to which featherbedding is a burden on interstate commerce." In any enterprise system, he declared, "rules which are designed to defeat man's efforts to produce the most with the least effort cannot be justified and should not be tolerated." The probe should be carried out first in the railroad industry, he said.

•

Railroads in Canada have junked the old policy of going after rate increases after labor unions have won increased wages. They're going after the money to pay wage increases before — not after — agreeing to the increases. The Canadian National and the Canadian Pacific are faced with a Conciliation Board recommendation for wage increases totaling about 14 cents an hour over a two-year period for some 130,000 non-operating employees. Pending a decision on whether to accept or reject the wage-boost recommendation, the roads have applied for an immediate rate increase of 19 per cent. An early hearing is requested "in view of the urgency of the situation and mindful of the fact that a strike vote is being taken..." However, approval of the 19 per cent rate-hike proposal doesn't mean that the roads will give automatic acceptance to the wage demand.



. . . tells how aluminum signs save on maintenance

"We put 'em up . . . and leave 'em up." That's what one chief maintenance engineer says about signs and crossbucks of Alcoa® Aluminum.

And it's no wonder you can "install 'em and forget 'em." These tough, weather- and corrosion-resistant signs won't rot or warp. They never need protective painting. They can be reflectorized for high visibility day or night. They last twice as long. The message film won't delaminate even if punctured or damaged.

And the best part is that signs of Alcoa Aluminum cost just about the same as signs of inferior material—*yet they save you much more in labor and replacement costs.*

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As a cost-conscious railroad man, you recommend expenditures *only* for *essential equipment* and *materials.*

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Bird Self-Sealing Tie Pads are Recommended for:

BRIDGE DECKS • CURVES • SWITCH TIES • HIGHWAY GRADE CROSSINGS AND OTHER PAVED AREAS • CROSSING FROGS • INSULATED JOINTS • WITH SMALLER TIE PLATES • PILE CUTOFFS • THROUGH-STATION PLATFORMS • OUT-OF-FACE INSTALLATIONS IN RAIL-LAYING PROGRAMS • SANDY LOCATIONS • ALL OTHER AREAS WHERE TIE LIFE IS SHORT OR REPLACEMENT COSTS HIGH.

The convention story in pictures

Presented on these pages is a pictorial record of people and events at the conventions of the Roadmasters' and Bridge & Building Associations, held at the Conrad Hilton Hotel, Chicago, September 15-17. It's not complete but it gives some idea who was there and what they did.

WELCOMING members at opening session was E. L. Anderson, pres. of the Roadmasters' and ch. engr. (ret), Frisco, and . . .

. . . W. H. HUFFMAN, president of the Bridge and Building Association and assistant chief engineer, C&NW.

• A total of 1,208 members and guests registered at the Roadmasters' and B&B conventions last month.

As might be expected this was moderately below the level of recent years. However, attendance in the meeting rooms was surprisingly good, indicating, in the minds of observers, a high degree of interest in the proceedings. It was noted that attendance was best when the subject under consideration was concerned with mechanization or other means of reducing costs. It was also noted that discussion from the floor was most active when such subjects were being considered.

There was much food for thought in the proceedings. Two joint sessions were highlighted by addresses of top railway officers. One by R. G. May, vice president, Operations and Maintenance Department, AAR, told of recent legislative gains by the railroads but emphasized the fact that more relief was needed. Another by C. J. Fitzpatrick, president of the C&NW, spoke of the progress made to date in mechanizing the maintenance of way forces. He added, however, that "we are only on the threshold of such mechanization and that 25 years hence railroad men and maintenance equipment designers will look with amusement at some of the machinery which we pride ourselves with having today."

In a third major address, Clark Hungerford, president of the Frisco, developed figures to show that further progress is needed in efficiency to match increases in wages. He is convinced that the "entire railroad plant of the future will reflect a higher state of development than the one we know today . . ."

The activities started at the registration desk

REGISTRATION congestion was relieved by registering members and guests in the Waldorf room on Sunday and Monday. Banquet tickets also were obtained there.

IDENTIFICATION badges were prepared by typists at registration desk.

PAST, PRESENT AND FUTURE of railroads was the subject of an address by Clark Hungerford, president, Frisco.

GREETINGS and wishes for a successful convention are brought by B. R. Meyers, president AREA & chief engineer, C&NW.

75TH ANNIVERSARY of the Roadmasters' Association was noted by H. E. Kirby, past president and cost engineer, C&O.

SUPPLY MEN J. W. Davis, Kershaw Mfg. Co., and J. J. Nolan, True Temper Corp., get into a huddle to talk things over.

GOOD JOKE? Enjoying a laugh is F. L. Etchison, chief engineer, WM, and P. S. Settle, Railway Maintenance Corp.

WHO, ME? R. P. Underwood, Matisa Corp., turns suddenly when found talking with H. J. Weccheider, engr. M/W, Erie.

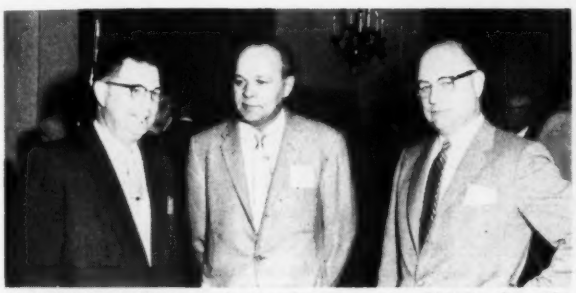
Interest was at high level both in and ou

BETWEEN SESSIONS, L. Kelley, sls. mgr., RR Accessories, swaps pleasantries with F. H. McKenney, engr. trk., CB&Q.

BIRDS OF A FEATHER. Southern Pacific and Northwestern Pacific men get together. J. C. Rouse, rdm., SP; C. A. Inglish, asst. div. engr., SP; A. K. Ulvila, rdm., SP; C. E. Neal, div. engr., NWP, and new president of Roadmasters'; and D. B. Zumwalt, asst. div. engr., SP.

INSPECTION TRIP on QNS&L is described and illustrated with slides by T. F. Burris, chief engineer, sys., C&O.

PANEL DISCUSSION on New Trends in B&B Mechanization sparked much interest at a B&B session. R. L. Fox (standing), process engr., Sou, was moderator for panelists J. V. Inabinet (backgr'd), gen. br. insp., SAL, and W. E. Chapman, ch. engr. mtce., CofGa.



NORTH AND SOUTH. L. A. Loggins, ch. engr., T&NO, gives the southern viewpoint as H. J. Fast, asst. ch. engr. sys., CNR, and M. S. Westlund, v.p., Jackson Vibrators, Inc., listen.

RAIL WELDING was subject for discussion when H. M. Williamson, engr. M/W, SP, met H. A. Schlatter, senior and junior, of H. R. Schlatter, Ltd., and R. A. Baer, NCG Div. of Chemetron, Inc.

and out of the meeting rooms

BALLAST PLOWING was discussed when M. G. Counter (left), asst. engr. trk., and G. O. Graham (right), rdm., both of CB&Q, met F. E. Rogers, sls. rep. and J. W. Christoff, v.p., both of Mannix International.

OLD FRIENDS—W. A. Maxwell, dist. sls. mgr. (ret), American Brake Shoe, and G. M. O'Rourke, asst. engr. m/w, IC.

UNDIVIDED ATTENTION was given C. J. Fitzpatrick, president, C&NW, when he addressed joint session on Tuesday afternoon.

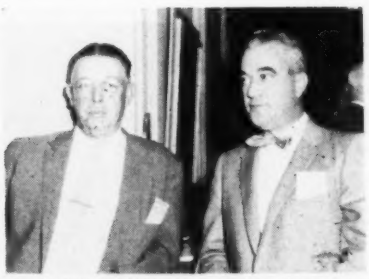
More convention pictures . . .

TALKING IT OVER are J. E. Yewell, chief engineer (ret), B&LE; O. R. Hansen, supervisor welding, Teleweld, Inc.; and H. H. Talboys, vice president, Ry. Equip. Div., Nordberg Mfg. Co.

PUNCH LINE is reached by C. R. Turner (right), supvr. wk. equip., D&RGW, as he tells story to N. K. Moses, pres., R R Rubber Products, Inc., and T. Y. Gehr, mgr. trk. equip. dept., Pullman-Standard.

TIME OUT—H. M. Harlow, asst. gen. supvr. B&B, C&O, and past pres., B&B Assn, relaxes with W. L. Short, asst. engr., MP.

LONG ISLAND members Lee Spencer, supvr. trk. (ret), and J. W. Rowland, asst. engr. const., talk things over.



DURING THE RUSH, A. C. Danks, br. engr., Union RR, takes time for talk with F. H. Schuales, Minnesota Mining & Mfg. Co.

MEN, METHODS AND MATERIALS was the subject of address by R. G. May, vice-president, Oper. & Mtce. dept., AAR.

PRODUCTIVITY—A Key to Prosperity was subject of address on Tuesday afternoon by C. J. Fitzpatrick, president, C&NW.

USES OF PRESTRESSED CONCRETE were described by L. P. Nicholson, Structural & Ry. Bur., Portland Cement Assn.

These new officers were elected

Roadmasters' Association

C. E. Neal, division engineer, Northwestern Pacific, was advanced from first vice-president to president; S. E. Tracy, superintendent work equipment, Chicago, Burlington & Quincy, was advanced from second vice-president to first vice-president; and E. F. Snyder, assistant to chief engineer, Illinois Central, was elected second vice-president. R. G. Simmons, general roadmaster, Chicago, Milwaukee, St. Paul & Pacific, was re-elected treasurer. Two new directors were elected. These are J. E. Eisemann, district engineer, Atchison, Topeka & Santa Fe, and J. E. Shaw, roadmaster, Texas & New Orleans (SP Lines in Texas and Louisiana).

C. E. Neal
President-elect
Roadmasters' Association

M. H. Dick
President-elect
Bridge & Building Association

Bridge & Building Association

M. H. Dick, editor, *RT&S*, was advanced from first v.p. to pres.; B. M. Stephens, asst. to exec. vice-pres., SP Lines in Tex. and La., was promoted from second v.p. to first v.p.; H. D. Curie, mast. carp., B&O, was promoted from third vice-president to second vice-president; and G. W. Benson, div. engr., C of Ga, was elected third vice-president. L. C. Winkelhaus, arch. engr. (ret.), C&NW, was re-elected treasurer. J. M. Lowry, ch. engr., StLSW, and R. C. Baker, engr. of struct., C&EI, were elected directors for one year. H. A. Matthews, gen. fore. b.&b. & w.s., Frisco, and M. J. Hubbard, asst. ch. engr. sys., C&O, were elected for three years.

Tests "dry" lubricant for curves

Experiments carried out on Reading over four-year period show that wear of the high rail on curves was reduced substantially by a new material applied to flanges of locomotives.

● The results of a series of tests which showed that a new "dry" lubricant applied directly to the wheels of locomotives reduced rail wear on curves by an average of 35 per cent, have been announced by the Reading.

The findings were based on a four-year series of tests on curves of the mountainous Catawissa branch in East Central Pennsylvania. The area of the tests includes 150 curves in a 35-mile stretch of track, comprising a total of 47,000 ft of curved track.

The curves in this territory had shown "very serious" wear during periods extending to 10 years, and some of the rail had to be replaced in three years, the railroad said.

In making the more recent curve wear tests, three series were run: (1) without lubrication; (2) with petroleum-based lubrication applied to the rails; and (3) with the dry lubrication applied to the flanges of wheels from four self-contained units on each locomotive.

Heavy tonnage freight trains powered by three to four diesel units were selected for the tests. Special "catch trays" for collecting minute particles of steel worn from the rails by passing trains, were designed by the railroad's research engineers. These were placed inside and beneath the heads of the high rails on the test curves.

The tests were begun on July 1, 1954. Eight trains were used in each series of the initial tests in that year, with results indicating that additional tests were necessary for positive conclusions, the company said. In succeeding years, scores of similar tests were conducted under all weather conditions.

The flange lubricant which ultimately produced minimum wear, according to the tests, is a commercial preparation of the National Aluminate Corporation. The chemical preparation—molybdenum disulfide—is incorporated in a solid lubricating stick and applied to locomotive wheel flanges by a holding device.

Here's what the tests showed, according to the railroad:

(1) There is an average reduction of 35 per cent in rate of rail wear at curves per 1,000,000 gross tons of traffic with the dry lubrication applied to the wheel flanges of locomotives.

(2) Rail wear is doubled in cold weather, as compared to warm weather. However, molybdenum disulfide is effective over a wide range of temperatures and is unaffected by low temperatures.

(3) After one year of application from all trains over the test area, residual of molybdenum disulfide on wheel flanges reduced the amounts of rail wear on curves with greater effectiveness.

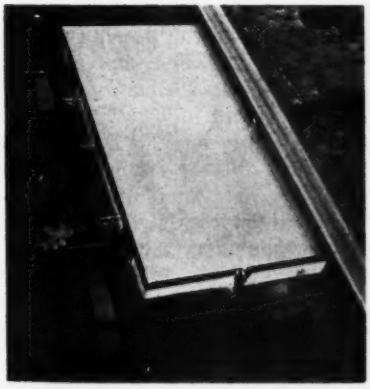
How the tests were made

The catch trays used to collect the abraded metal were so designed that the metal abraded from the rails by the locomotives could be separated from that worn off by the cars. The catch boxes used for this purpose were 30 in long, 16½ in wide and 3 in deep. Each box contained two sliding trays 4 in wide and 1½ in deep. The top tray was equipped with a spring-loaded slide and a pull trigger.

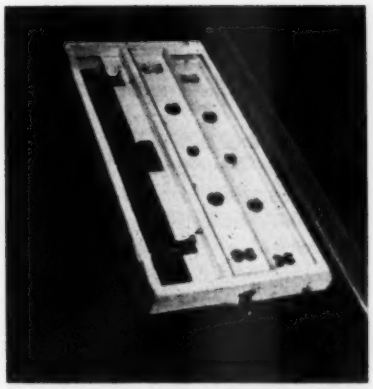
With the top tray held to one side the bottom tray collected the abraded metal of the locomotive. After the last wheel of the locomotive had passed over the box the trigger was actuated with a pull chain and the top tray sprung into position to catch the abraded metal from the cars.

Each tray was fitted with seven Alnico horseshoe magnets to facilitate collection of the abraded metal which was removed from the tray with another magnet.

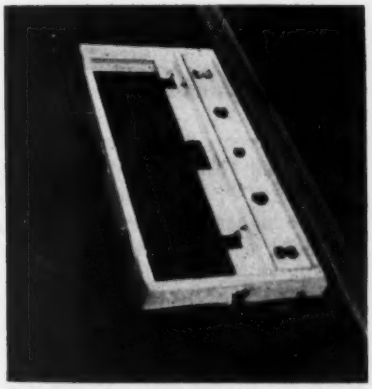
LOCOMOTIVE approaching catch box. Man is ready to spring top tray into position after locomotive has passed.



CATCH BOX in position at high rail to collect abraded metal. Aluminum cover protects box from the weather.



COVER removed and top tray pulled back, exposing bottom tray to catch abraded metal produced by locomotive.



TOP TRAY has now been sprung into position to catch abraded metal from cars of train. Metal is removed with magnets.

This bridge had to be anchored a

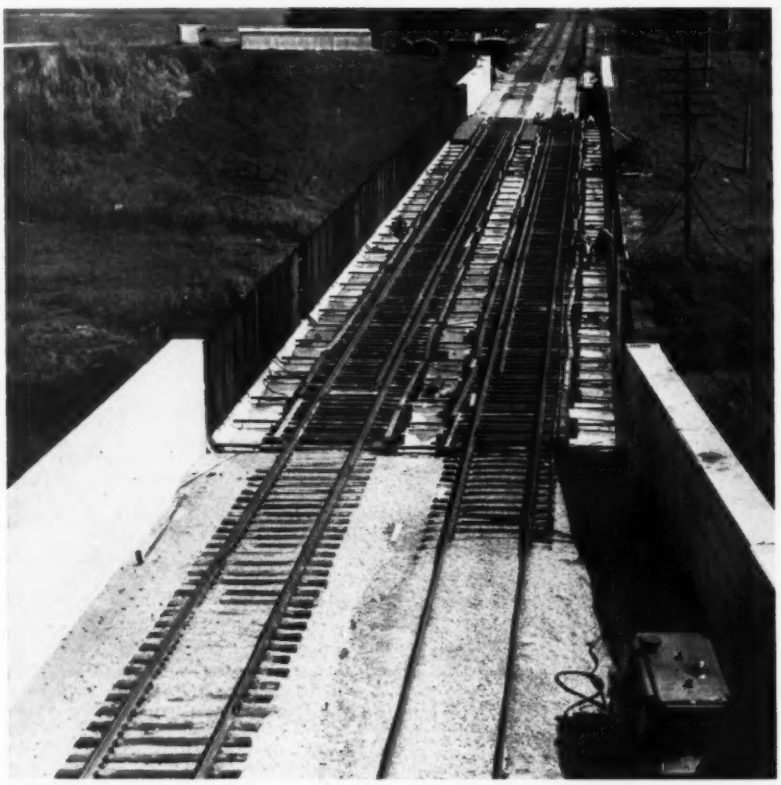
A bridge on the Missouri Pacific near St. Louis has been converted into a watertight "trough" and anchored to keep it from floating away during times of high water. This unusual treatment became necessary when levees on each side of the stream were raised above the tracks which had to be kept at the existing level because of operating conditions in the vicinity.

• To protect the areas between East St. Louis and Thebes, Ill., from the floodwaters of the Mississippi river, the Corps of Engineers, U. S. Army, decided to raise the elevation of the existing levees. This decision made it necessary for the Missouri Pacific to raise its tracks at a number of locations on the Illinois side of the river.

At one location, however, the tracks and a major bridge could not be raised due to their proximity to the road's Dupo freight yard. A raise at this location would cause a steep track grade from the yard and create prohibitive operating conditions. It was evident that measures, different from those used at the other locations, were needed to fit the tracks and bridge into the Corps of Engineers' plans.

The bridge is designated No. 39 by the railroad and carries two main tracks over Prairie du Pont creek which flows into the Mississippi. It consists of five deck plate-girder spans ranging from 43 to 80 ft in length and totaling 275 ft between abutment backwall faces. The abutments and four piers are of the concrete-pile type. The tracks are level across the structure, and were supported on a creosoted-timber ballasted deck.

Levees existed at each end of this bridge, their tops being at the same elevation as the base of rail. Under the plan of the Corps of Engineers the levee on the south or Dupo end was to be raised 7.5 ft. The levee on the other end was to be raised 6.5 ft.



BRIDGE NO. 39 carries tracks of Missouri Pacific below top of raised levees. Hence, it had to be made watertight. In this view, side plates have not been applied.

Several problems involved

To prevent floodwaters in the creek from breaking through the levees at this point in the event they became higher than the track, plans called for placing a welded steel floor over the bridge and for building sidewalls to top-of-levee level across the bridge and through the levee sections. Thus, in effect, the track would cross the stream in a trough. The floor and sidewalls, of course, had to be watertight. This posed a problem because provision also had to be made for the expansion of the bridge steel and for the drainage of surface waters.

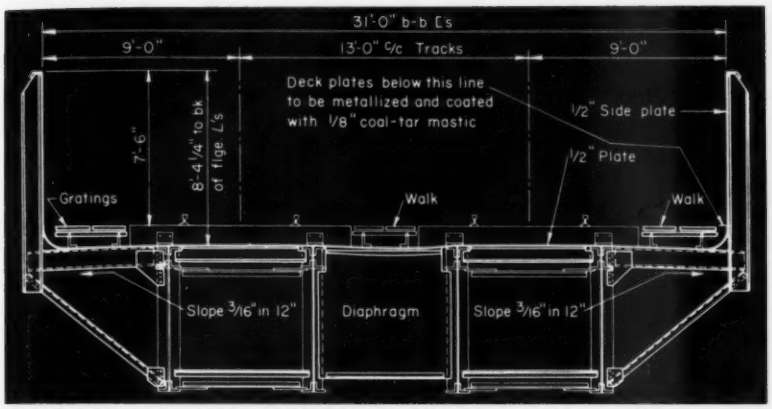
There was also the problem of buoyancy. Provision would have to be made to restrain the bridge against the uplift (as well as lateral) forces that would occur if the water rose above the bridge deck.

Each of the piers and abutments was supported on 14 reinforced-concrete piles, 40 ft long, driven in two lines and capped with concrete. The caps were about 6 ft wide and 4 ft deep and were cast with their reinforcing tied in with that of the piles. Hence, it appeared that the caps would provide adequate anchorage for the girders.

The levees were to be raised to provide a 20-ft top with 3-to-1 slopes. Since the near toe of the slopes intersected the track level behind each bridge abutment, the sidewalls for the "trough" had to be carried for some distance from the bridge. At the north end, the sidewall approach had to be about 101 ft long to extend to the far edge of the levee top. On the south side the sidewall approach had to be about 130 ft.

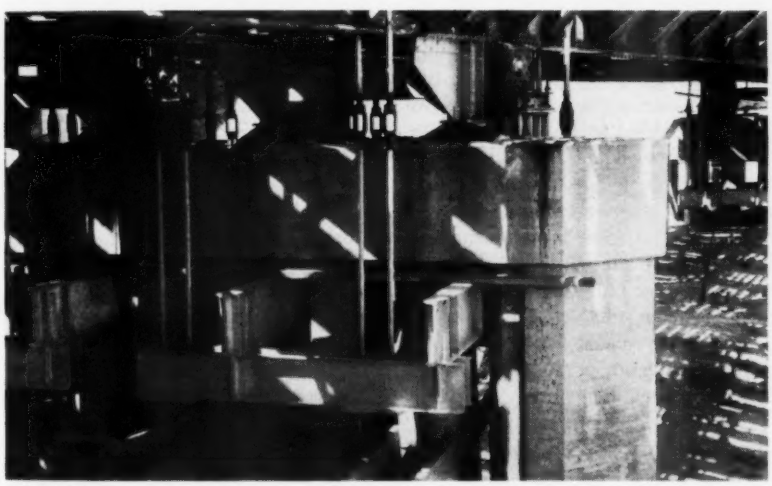
ed against uplift

Because of their trough-like design the . . .



DECK PLATES, made of corrosion-resistant low-alloy steel, are ½ in thick and 9 ft by 16 ft in area. The bridge ties rest directly on the deck.

. . . Spans were secured to caps like this



ANCHORAGE consisted of hanger rods from pins in girders to anchor beams bearing against crossbeams which were threaded between piles beneath the bent caps.

Plans were drawn up accordingly, approved and the necessary material ordered.

Convert steel spans

The first work was the conversion of the existing spans from ballasted-deck to open-deck, after which all spans were raised 10 in on steel pedestals. Other work on the spans included the application of diaphrams between tracks, the installation of strut-and-bracing cross frames between the girders of each span, and the construction of bracket and post supports for the new side walls.

The diaphrams were made concave along their upper edges to form a slight dip between tracks when the deck plates were applied later. Also, the side brackets were fashioned with a dip at their outer ends. The purpose of these dips was to direct the flow of surface waters on the deck plates for disposal through drains.

Build girder anchorages

While the work on the spans was underway, the construction of the girder anchors was started. This was done by tying the girders by hangers to cross beams beneath the caps. Here's how this work was carried out:

I-beams were threaded between the piles under the cap of each pier. These were long enough to project about 2.5 ft beyond the sides of the cap. Two bearing plates for each cross beam were cinch-bolted to the underside of the cap. At the fixed ends of the spans these plates had stops welded to them to keep the cross beams in proper lateral positions. In addition, each cross beam had companion bearing plates with welded stops to keep them in correct longitudinal position. At the expansion ends of the spans, the stops were omitted from the bearing plates and the positions of the beams were maintained by pins set in larger diameter mating receptacles.

A hole was drilled near the end of each girder through which a 4-in pin was inserted. A 1¾-in anchor rod with turnbuckle was hung from each end of the pin. The two anchor rods from each girder were then connected to an anchor beam supporting one end of each of the cross beams. Finally, the turnbuckles of the hanger rods were tightened to secure the girders firmly to the cap.

The anchorage at the abutments, both of which support fixed ends of the spans, is somewhat different. On each side of each girder, a plate was riveted to the two end stiffener angles. These plates were then tied with large bolts to the top surface of each shoe casting. Two long anchor bolts were then inserted through holes in the base of the shoe casting, through the new pedestal and through the concrete cap. Washers and nuts were then applied and tightened, firmly securing the girders to the caps. A layer of reinforced concrete was then cast beneath the cap to encase the lower ends of the anchor bolts.

Approaches are sealed off

While the anchorage work was progressing, work was begun on the approaches to the bridge. Steel sheet piling was driven around the periphery of these areas to seal them off underground as well as to provide support for the concrete side walls. The sheet piles varying from 18 to 29

EXPANSION joints between spans were sealed by a premoulded rubber filler compressed between clamping plates.

DECK PLATES and side plates were welded together with continuous V-welds. All transverse seams were ground flush.

APPROACHES were sealed off by sheet piles and the walls were made watertight.

ft in length, were driven with their tops about 5 ft below base of rail.

The north approach was built with the side walls parallel and about 31 ft apart. In the south approach, however, it was necessary to make provision for a future turnout. The walls here are about 31 ft apart at the bridge and 46 ft at the levee end. The wall footings are of concrete and encase the top 2 ft of the sheet piles. They support concrete walls, 12 in thick and 9 ft 6 in high. Subsurface concrete cross beams or struts, were constructed between the two wall footings and are supported on creosoted-timber piles.

An interesting feature of the approaches was the manner of sealing the expansion joints provided in the concrete side walls. In addition to the premoulded joint filler normally used, a rubber waterstop also was installed. This is a strip of rubber, about 9 in wide, applied transverse to the joint to form a water barrier. It extends up the center of the wall from a rubber plug below the top of the steel sheet piles.

The deck plates for the bridge were made from corrosion-resistant low-alloy steel. They are ½ in thick and 9 ft by 16 ft in area, except for those at the ends of the spans where the widths were varied to suit the span lengths. They are curved upwards at their outer edges to eliminate side corners. The side plates also were fabricated from the same material.

The deck and side plates were welded together with continuous V welds. All transverse weld seams in the deck plates were ground down flush to the plate surface to insure drainage of surface waters. The plates were also welded underneath to the girders, diaphrams, brackets and intercostals.

Short angles were welded to the deck plates for holding every third tie at its proper spacing on the deck. Bolts were used to fasten these ties to the vertical legs of the angles. The ties are 8-in by 10-in by 10-ft, spaced at approximately 12-in centers.

To protect the deck plates from corrosion due to brine drippings their upper surfaces were metallized with 0.015 zinc and coated, ⅛ in thick, with coal-tar mastic before the ties were placed. The metallizing work was done by railroad forces at the site.

The metallizing facilities were set up adjacent to the tracks north of the bridge. These consisted of a large air compressor, a bin for the storage of hard, flint-like sand, an oil-fired sand dryer, a portable sand pressure drum, the metallizing equipment and a large timber platform. A locomotive crane, used in connection with the bridge work, unloaded the deck plates from the cars and placed them on the timber platform. This crane was also used to pick up the plates after being metallized and to install them.

Three men were assigned to this work. A small area of the surface of each plate was cleaned at a time by sand blasting, then metallized. This was repeated until the entire surface of a deck plate, except around its edges, had been coated with zinc. The edges were not coated before installation because of possible damage to the zinc coating while the plates were being welded in place.

After installation and the grinding of the welds, these areas were then metallized. (See accompanying box for more information on metallizing.) The mastic was applied over the metallic coating to protect the

latter from chipping by falling objects and from abrasion by the ties resting directly on the deck.

Watertight expansion joints

Another interesting aspect of this work was the method used to make the deck watertight at the expansion joints between spans and at the abutments. Two types of joints were used. One was a fixed type which was used at the abutment ends of the steel deck and the other was a movable type used at the deck expansion joints.

At the abutments the existing back walls were partially removed, then rebuilt to raise their tops to the same elevation as the deck plates. A seal plate was cast integrally with and embedded in the concrete. This was a ½-in by 12-in plate doweled into the concrete. The near edges of this plate and that of the bridge deck plate were separated by about a 1¾-in gap. Seal plates also had been cast in the side walls to the same contour as the side plates of the deck spans.

The gap was sealed by spanning it with a strip of rubber, ½ in thick by 7 in wide, and fastening it between a filler plate and clamp plate on each side of the gap. The filler plates were welded to the deck plates of the spans and to the seal plates of the abutments. Cap screws, at about 6-in centers, were used for the clamping action. These were made from aluminum bronze.

For sealing the gaps in the deck plates of the spans, a slightly different design was used. The rubber seal at these joints is flat along one edge and in the form of a continuous bulb on the other. On one side of the gap, the short leg of a 3½-in by 2½-in by ⅜-in angle was welded to the deck plate, forming a recess. The bulb edge of the rubber seal was forced into the recess and its flat edge was fastened to the deck plate on the other side of the gap between a filler plate and clamping plate. Any water pressure from below works against the rubber seal and makes it tighter.

Seal drains against backwater

Three lines of drain holes were provided through the deck plates as outlets for surface waters. One line of 11 holes was established at the low point of the dip in the deck plates between tracks. The other lines, each having 11 holes, were established along the dips at the sides.

Provision was made to seal these drain holes against the entrance of water from below. This was done by placing bronze float valves in the drains beneath the deck. The valves were each enclosed in a wire cage to prevent trash from fouling them.

In the event that water on the Mississippi river side of the south levee should rise above the top of that levee, it will be prevented by stop logs from flooding area protected by the north levee. Recesses were built into the side walls of the north approach at the levee end, into which 8-in by 16-in by 32-ft stop-log timbers can be fitted across the track opening. The timbers are stored in a metal building built on the crest of the north levee. In the event of high water, a crane will be called upon to set the timbers in position. To give ready access to the stop logs, the roof of the storage is designed to be removed by the crane.

The road is confident it now has a structure that is secure against a breakthrough of floodwaters. The work was done by railroad forces under the general direction of W. H. Hobbs, chief engineer, and the direct supervision of R. E. Peck, bridge engineer. F. H. McGuigan, bridge construction engineer, had field charge of the work.

UPPER SURFACES of deck plates, except near edges, were given a metallic coating. Surfaces at edges were coated after plates were welded.

Gets good results from metallizing

The Missouri Pacific has been metallizing certain serfaces of some of its steel bridges for many years (see *RT&S*, August, 1951) as protection against corrosion from brine drippings. It first tried out this form of protection on one of its Kaw River bridges at Kansas City, Mo., in 1936. The results obtained from this first application were not entirely satisfactory as the effective life of the metallic coating was only about 13 years. This was attributed to (a) failure to clean the steel properly; (b) delaying the application too long after the sand-blasting operation; and (c) failure to apply the metal in sufficient thickness. On that bridge the metallizing coating was made 0.008 in thick.

For subsequent work, the railroad increased the thickness of the coating to 0.012 in. This seems to be adequate; no other coating failures have been observed to date, even after 20 years of service. The metallic coating applied to the deck plates of bridge No. 39 near Dupo was made 0.015 in thick because here the plates are subjected to the unusual condition of having the ties in direct contact with them.

When the metallizing was first started by the Missouri Pacific, the road metallized only the top surfaces and edges of the upper flanges of floorbeams and stringers and the same areas of beam and girder spans. The practice has now been extended to include the stringer laterals and the top lateral plates. Also, these areas on all new bridge steel are metallized, regardless of whether or not the steel is to be installed in brine territory.

The expected effective service life of 20 years has already been exceeded on some structures. Because of the excellent results from metallizing, the railroad plans to continue using it as a regular practice.

PRECAST CONCRETE was used for all elements of the building except the floor. Walls are tilt-up type.

Concrete building is

"World's largest testing machine"

● Full-size concrete bridge girders and other members can be tested to destruction in a new building that was shown publicly for the first time on September 8.

The structure was described as a completely unique facility which may have a revolutionary effect on future structural testing laboratories. It was built by the Portland Cement Association as an addition to its Research and Development Laboratories at Skokie, Ill., near Chicago. A second new laboratory, a Fire Research Center, will be placed in operation at the same location early in 1959.

Because of its unique design the new testing building is referred to as the "world's largest testing machine." Except for the floor it is constructed entirely of precast concrete members, but is unique primarily because of the testing floor which is 56 ft wide and 120 ft long. The floor is designed to act as a hollow concrete box girder in the longitudinal direction and a Vierendel girder in the transverse direction. The overall depth of the girder is 12 ft, with the first floor slab joined to the basement floor slab by webs 8½ ft high.

The first floor slab, which is 24 in thick, is pierced by a total of 690 holes on 3-ft centers, by means of which loads are applied and test specimens are secured. To make most tests, steel rods are attached to the beam or girder being tested, and extended downward through the holes to connect with hydraulic jacks in the basement. These jacks pull down on the rods, exerting enormous loads on the test structures above.

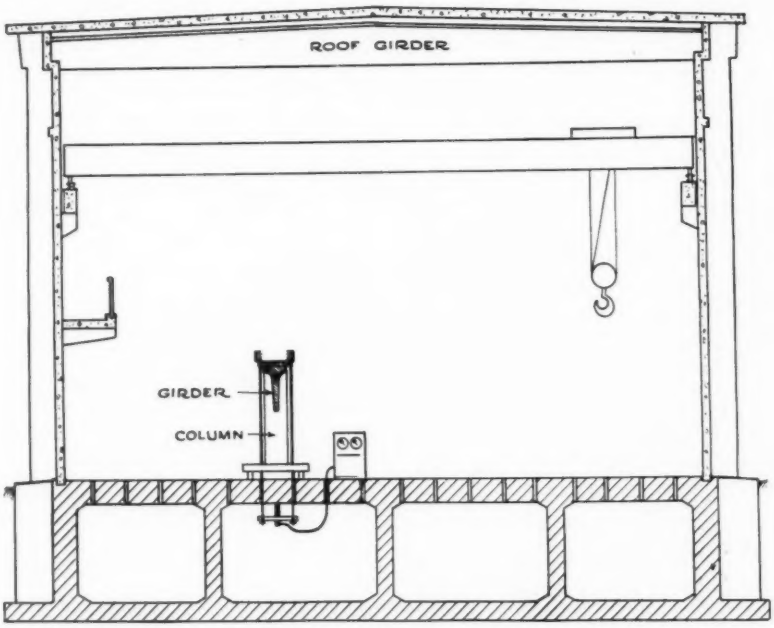
This design, it is pointed out, gives the laboratory an almost limitless flexibility. The floor can withstand pressures produced by the hydraulic jacks of more than 10 million pounds. Any structural element from a short girder to a full-size floor slab or roof shell can be subjected to local loads as high as 30,000 lb per sq ft, and a slab the size of the entire testing floor could be subjected to loads amounting to many thousands of pounds per square foot over its entire area.

In fact, according to Dr. A. Allan Bates, the Association's vice-president for research and development, the floor is designed to handle every test for which the staff could imagine a future need, plus somewhat more.

The new laboratory is already at work testing various types of structures and building units. A project is now underway to develop additional engineering information about newer types of concrete shell roofs. Another project is aimed at development of better methods of connecting precast concrete units, such as factory-produced beams, wall panels, columns and girders. Prestressed concrete will also be studied, to extend its applications still further.

How tests are made on hollow-girder-type floor

Test specimen in place on floor



CROSS SECTION of structural laboratory showing how 60-ft girder was arranged for testing. Floor has 690 holes for accommodating steel rods that apply the load.

Jacks apply load from underside

Instead of housing testing machines, a new structural laboratory built by Portland Cement Association is a giant testing machine in itself, capable of exerting test forces greater than 10 million pounds. Test forces are applied by hydraulic jacks acting against the floor of building, which resembles a hollow concrete box girder. Floor is 56 ft wide, 120 ft long.

Although the testing floor is the most unusual portion of the new laboratory, the rest of the building shows off some advanced practices in the structural and architectural use of concrete. The structure is 56 ft by 176 ft in plan. A bay 22 ft long at one end contains three stories of offices and shops. The rest of the building is a single large room, 40 ft high, with a balcony for visitors along one side at the second story level.

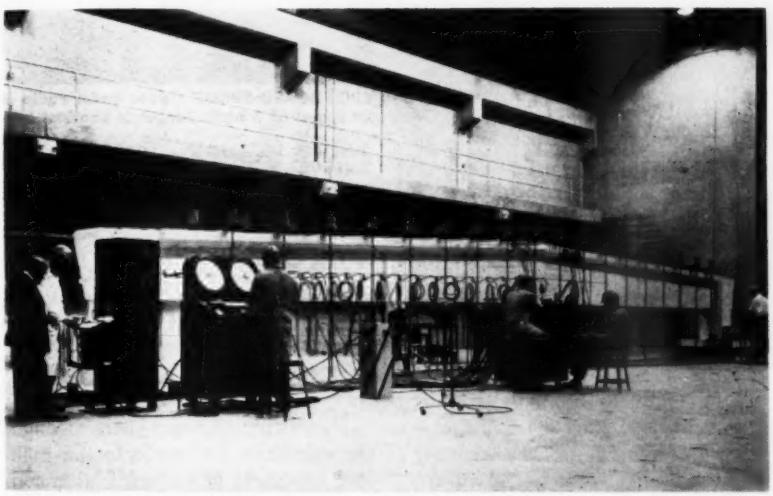
The entire laboratory above the first floor was assembled from precast units, erected by power equipment. These units were designed by a new method of engineering analysis called "ultimate strength design," which, it is said, is beginning to supersede the method currently used by most structural engineers. The "ultimate strength" method takes into account more exactly than older methods the inherent strengths of concrete and reinforcing steel, and makes possible the construction of longer spans and higher buildings out of reinforced concrete.

High-strength alloy steel reinforcing and 5,000-psi concrete were used in the construction of the precast structural members. The slender 58-ft T-shaped roof girders are simply supported on columns cantilevered from the foundation. Tilt-up wall panels were cast using newly developed plastic and rubber form liners to obtain decorative textures and patterns. The wall panels were cast on the floor of the building of lightweight concrete having a strength of 4000 psi at 28 days.

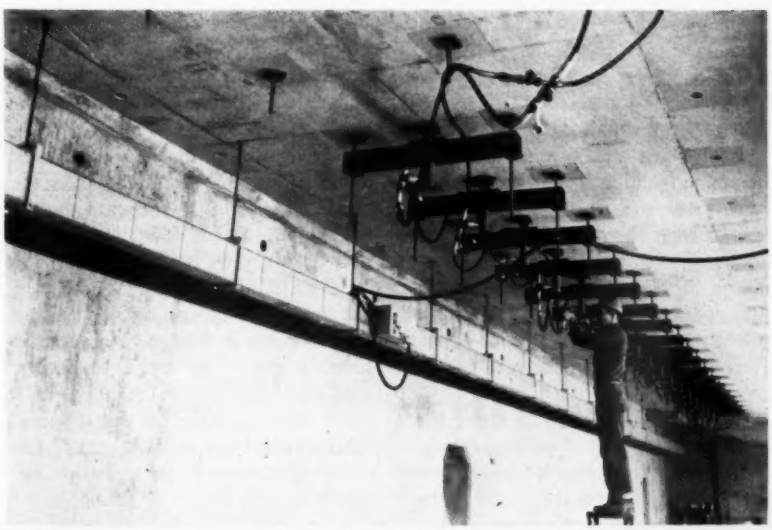
The roof deck is composed of hollow precast concrete units spanning the 20 ft between girders. Foamglass insulation and built-up roofing was applied on top of the concrete units.

The entire testing and casting area inside the building is served by a 20-ton crane and is air-conditioned to 70 deg F and 50 per cent relative humidity. The building contains a full basement — actually composed mostly of the interior of the hollow box girder—providing ample space for storage, some casting facilities, and shops. Casting of the larger test specimens is done on the test floor. Facilities for producing concrete, casting smaller specimens and many other technical services are available in the main PCA laboratory buildings nearby.

At present, the laboratory has hydraulic jacks capable of a combined force of about 4 million pounds. Additional jacks will be obtained as they are needed in future experiments. Each jack is calibrated so that loads on a specimen can be measured by highly accurate oil pressure meters. Reactions — moments, forces and shears—are measured by electronic load cells designed and built by the laboratory's personnel. Strains are measured by mechanical and electric strain gauges, and the readings are recorded either by automatic or hand-operated strain indicators.



TEST FORCES are applied to girder through steel rods which can be seen extending from cross pieces over the girder down through holes in floor. Note balcony for guests.



HYDRAULIC JACKS, exerting pull against lower ends of steel rods, can apply forces of up to 100,000 lb through each hole. Beam in test broke under load of 360,000 lb.

In new track-raising system . . .

Spot board is spotted by radio

Remote control makes it possible for foreman, sighting through telescope, to move motor-driven spot board back and forth as necessary to locate it on a high spot.

SPOT BOARD BUGGY moves under radio direction at speed of 5 mph. Target is pendant type.

• The assistant foreman, in a seated position, was gazing through a scope, mounted on a carriage. He was looking ahead, over a jack block, also carriage mounted, to a spot board that was likewise mounted on wheels.

By manipulating push buttons on a box in front of him he could make the spot board move back and forth under its own power. By thus moving the spot board while sighting he could place it on a high spot without guesswork, and without assigning a man for this work.

The assistant foreman was engaged in a demonstration of a newly developed set of equipment for use in track-raising work. It is known as the Hayco Radio-Controlled Track-Finishing System. The Brice Hayes Company, Chicago, is the manufacturer.

Consist of the gang

In addition to the assistant foreman the surfacing gang in which he was working consisted of a foreman, two machine operators and nine laborers. They were using a Jackson Multiple Tamper, a Railway Trackwork hydraulic liner, and the Hayco Radio-Controlled Track-Finishing System. The gang was making an average raise of 1 in on a "dead" track, using five track jacks on each rail. The tie renewals already had been made on this track.

The three units comprising the new system (see description on opposite page) consist of a sighting buggy, a "jack rabbit" buggy and a spot board buggy. These are operated in accordance with the same three-point raising method that is used commonly by track men all over the continent. The sighting buggy replaces the conventional sighting block, the "jack rabbit" replaces the conventional jack block and the spot board buggy is used in lieu of the common spot board.

How it is used

Here's how a foreman uses the equipment in making a 1-in raise:

Seating himself on the sighting buggy, he adjusts the height of the telescope to the most convenient work height. If this happens to be 41 in, he sets the sight board of the "jack rabbit" to read 41 in on its vertical tape. He then adjusts the spot board so that its tape reads 42 in. He is now ready to raise track.

Looking through the telescope, he sights toward the spot board. He then signals the jack men to raise the track until the upper edge of the sight bar on the "jack rabbit" coincides with the upper edge of the white line on the spot board. The track is then at the desired grade. After the rails are brought to proper cross level, the men move forward to the next raising point.

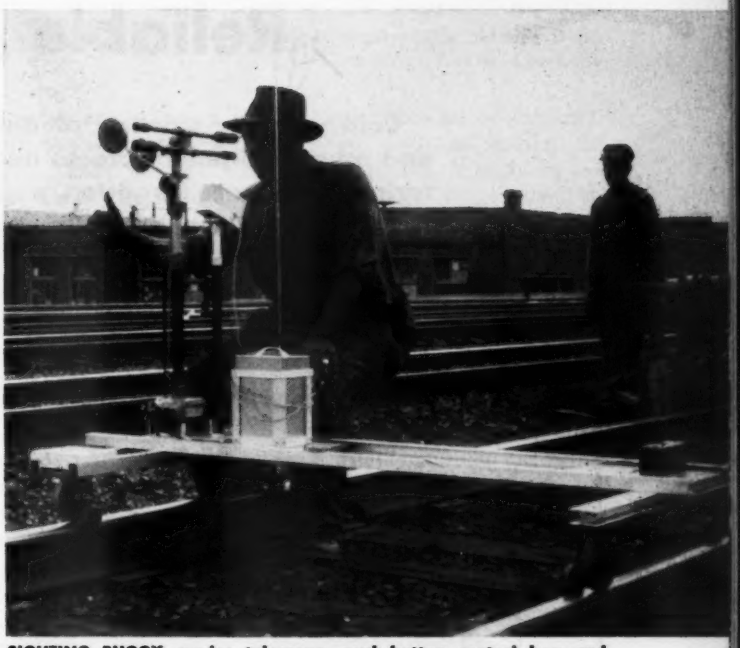
When it comes time to move the spot board forward, the sighting buggy and the "jack rabbit" buggy are held at their last working point. The sighting foreman then presses a button on the control box to blast a warning signal on the horn of the spot board buggy. Next he presses the button marked "forward" and holds it down. After a one second lag, while the radio tubes are heating up, the spot board buggy moves away.

Locating the spot board

By watching the spot board through the telescope, he can note the high and low spots in the track. He can move the spot board from one high spot to another until he is satisfied he has the one he wishes to work toward. The spot board then remains at that point, and only a trickle of power for the radio receiver is being consumed from the batteries until the spot board is moved again.

The test run of this new equipment evoked favorable comments from the track supervisor, the foreman and the assistant foreman. The latter stated that he not only could see both the spot board and the jack block better, but there was also no question about his eye being at the right point at the sighting end. The track supervisor said that the system resulted in a truer surface than by eye raising. Also with a large surfacing gang the supervisor was of the opinion that one-half of a man's time would be saved each day just for relocating the spot board.

SIGHT BAR on "jack rabbit" buggy (foreground) has notches in top edge to facilitate sighting on spot board (background).



SIGHTING BUGGY carries telescope, push-button control box and radio transmitter. Later models will have flanged wheels.

Description of sighting, "jack rabbit" and spot-board buggies

The track-finishing system described in this article is built around the Hayco Model HL Track-Lining Scope. It adapts the latter device to track-raising operations.

The buggies or carriages of the three units are essentially of the same size and construction. They have frames of steel and aluminum members mounted on four 6-in diameter wheels, each having a 3-in tread and ample flange. Hyatt-type bearings are used on all the carriages. The frames of the sighting buggy and the "jack rabbit" buggy are so designed as to keep all parts of the units from projecting outward beyond the 3-in wheel treads, and to provide a clearance of at least 12 in above the rails. This enables the units to pass and clear the low track jacks used with surfacing operations. Here are details of the three units.

The sighting buggy—This device has two clamping blocks, one over each rail, to which the Scope is clamped. Provision is thus made for surfacing from the low rail on both right and left-hand curves. The right-hand clamping block is adjustable for placing the Scope directly over the gage side of the rail. Two more clamping blocks, placed about 6 in from each Scope block, are for holding a vertical staff supporting a control box. The latter has three pushbuttons, one labeled "forward," another "return," and the other "horn." These are for controlling the movement of the spot board buggy and for sounding its horn.

A radio transmitter is carried in a cage on the sighting carriage. The cage is provided so that the transmitter may be removed each night to avoid theft and tampering. The transmitter, complete with batteries and a collapsible antenna, operates on the Citizens Band, under Class C. A 5-watt multi-channel system permits two channels to activate the propelling motor of the spot-board-buggy and another to control its horn.

Over one of the rear wheels of the sighting buggy is a plunger-and-spring type holding brake controlled by a lever.

Trailing behind over one rail is a seat riding on a caster-type wheel. Attached to the buggy by a steel strap, it carries the weight of the operator. It can be detached from one side and moved to the other rail.

The "jack rabbit" buggy—This unit serves in place of the conventional jack block. When a powered tamping jack with a sighting block is being used by the surfacing gang, the "jack rabbit" unit is not required. It is equipped with a holding brake and an elevated push handle for moving it down the track. It carries a vertical shaft, clamped to a block over one rail, which supports a triangular sight board that presents an orange-painted horizontal sighting bar, 18 in long. The top edge of the sighting bar has four half-moon segments cut out to permit the telescope operator to see the proper relation of the edge of the sighting bar to the distant white line on the spot board. When surfacing around a curve, two orange-painted side arms, normally folded slant-wise into an orange V, can be raised to form a sighting surface 42 in long.

The sight board on this unit is of the self-leveling pendant type. It is equipped with a checking level near its top and an adjusting weight which may be run to the right or left as desired to keep the top surface precisely horizontal.

A feature of the "jack rabbit" buggy is the trailing level board. This rolls along the track with the buggy. It has a spirit level so that the men jacking up the track can always maintain proper cross-level. The level board may be lifted out of its sockets on the buggy for use on other portions of the track.

When this unit is to be used around left-hand curves, the entire buggy, weighing 75 lb, is picked up and reversed in position on the rails. The sight board is turned 180 deg to face the telescope. The staff supporting the sight board is equipped with a measuring tape for determining the height of the top of the sight bar.

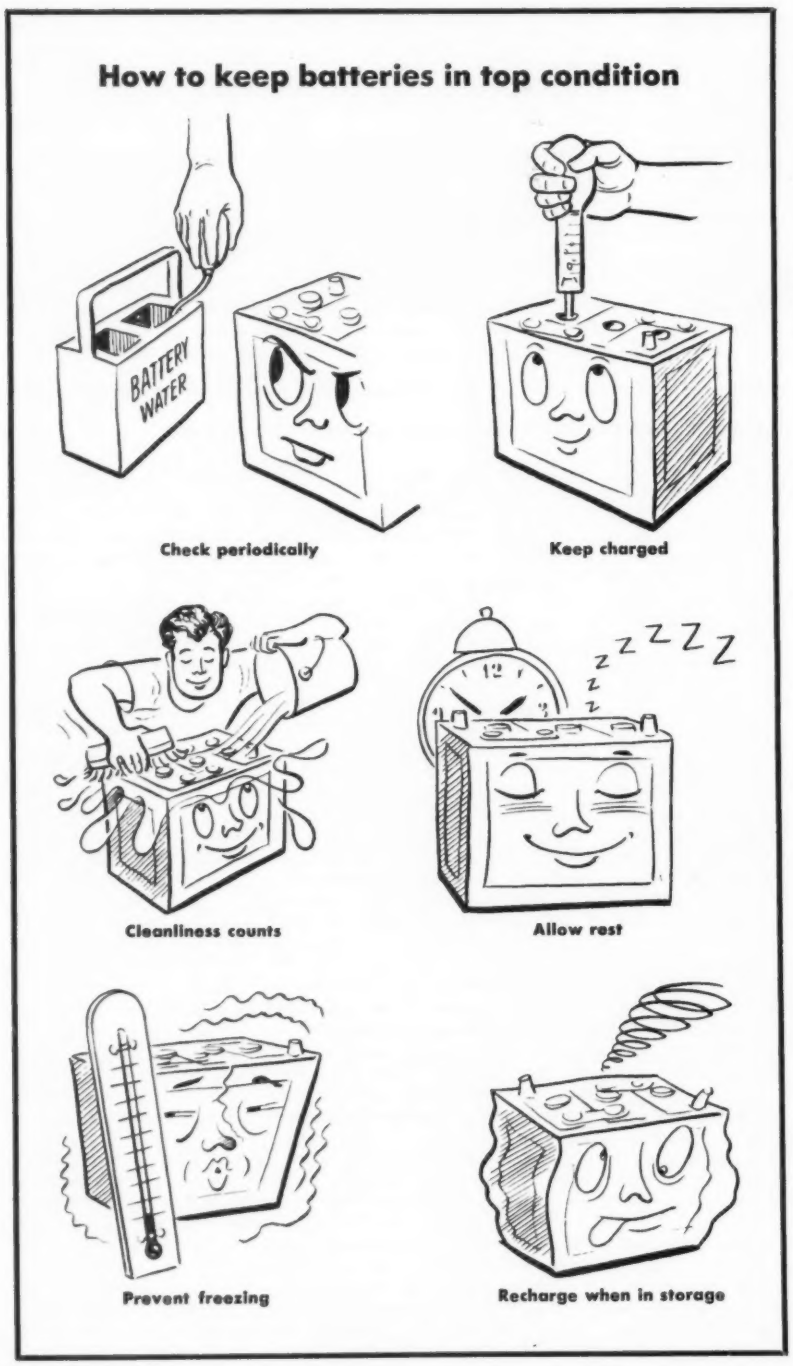
The spot-board buggy—A spot board, a battery, a radio receiver and an antenna are carried on this unit. The 12-volt dc battery is good for 60 amp-hr. A radio antenna and horn also are mounted on the deck of this unit.

The drive wheel of the spot-board carriage is an 8-in diameter hard-rubber wheel which propels the unit at a speed of about 5 mph. A spring exerts pressure to force the drive wheel down onto the running rail. Power from the 12-volt dc motor is applied through a worm-drive reducer which functions as an automatic holding brake to maintain position when the carriage is stopped on a grade.

A vertical staff, clamped to a block over one rail, carries the spot board. The latter is elliptical in shape and has a 2-in wide horizontal white line across a black background. The white line, 18 in long, is self-leveling and is equipped with a checking level and a pendulum-motion dampner. Above and at the center of the white line is a 4-in square white background marked horizontally in 1-in increments. These are numbered 1, 2 and 3 and are to assist the sighting foreman when making changes in grade. The spot-board staff can be clamped to a block over the opposite rail when working around left-hand curves.

Reliable push-button starting d

Cold weather starting of diesel-powered crawler tractors and other equipment places heavy demands on storage batteries. If they are forgotten, neglected or mistreated they may fail at a most critical time. Here are some tips on how to get peak winter battery performance.



• Machine owners have come to expect convenience and dependability when starting diesel engines in all weather, regardless of temperature extremes. Some machines come equipped with gasoline starting engines while others depend on cranking the diesel with electric starting motors. Even gasoline starting engines often have their own direct electric starting systems. In fact, most electric starting systems are dependent on one source of power—the storage battery.

In cold or heat, rain or snow, dependable batteries are ready to supply the needed energy for cranking. Dependable, did we say? Yes, but if batteries are forgotten, neglected, or mistreated, they may fail at a most critical time.

Let's see what a storage battery does. A storage battery is a reservoir used for storing energy for use at a later time. Electrical energy is put into it or drawn from it, but the actual storage process is a matter of chemistry.

A storage battery has a limited capacity (the quantity of electricity which can be taken from it in a given period of time) just as a water storage tank can maintain a flow of so many gallons per minute for only a certain number of minutes. The capacity of a battery (sometimes called its electrical size) is usually listed in "ampere-hours." This term is used to specify the amount of current a battery will deliver continuously for a definite number of hours or minutes. Capacity depends on how well the battery is constructed, its age, the size of the plates, and how many plates are assembled in each cell.

Why do storage batteries run down? Frequently the problem is the same as with any storage system: If more is taken out than is put back in, the reservoir for storage ultimate-

ng depends on battery care

By **Robert H. Hawkins**
Manager, Central Div. Service Dept.
Caterpillar Tractor Company

ly becomes empty. Added electrical loads, such as lights, heaters, two-way radios, sometimes impose more drain on the system than can be replaced by the generator.

There are other reasons. The first is age. After many hours use, the storage capacity is reduced. A second reason may be internal faults which continually drain off the electrical supply. Finally, improper maintenance and operation make a battery "age" quickly.

Any battery requires some attention for continued satisfactory service. Here are a few necessary rules for its care:

Periodic check

A most important step in extending battery life is a periodic check of the electrolyte or water level. Nearly all storage batteries have a reserve space for water in the top above the plates, and most battery manufacturers recommend that water be added until it is ⅜ in above the plates. Be careful not to overfill the battery because this allows the electrolyte to splash out and corrode all metal it contacts. Continued overfilling will result in so much loss of acid that the electrolyte may no longer be strong enough for a battery to deliver the required energy to crank the engine. If the battery requires water more often than once every two weeks, the charging rate is too high.

Keep battery charged

Maintain the battery in a normal state of charge—the specific gravity should be above 1.225—by keeping the generator output and voltage regulator in proper adjustment.

Never let a battery remain in a discharged condition for an extended period of time. The discharge action of a battery sulphates the plates but this can be driven off if the battery is charged soon after discharge. However, if the battery is allowed to remain too long in a discharged condition, the sulphate becomes hard and is very difficult to drive off the plates during charging.

Batteries have much longer service life if they are kept at or very near full charge at all times. In normal operation of equipment, some discharging of the battery takes place continuously, but the battery is not discharged to a great extent at any time. However, cycling a battery (regularly discharging it almost completely and then recharging it) will seriously affect its service life.

Cleanliness counts

Wash the battery occasionally with a "baking soda" solution (one pound of soda to one gallon of water) to neutralize the acid which is present on the case, and then rinse it with a stream of cold water. Cleanliness also includes the terminals. Wire brush them until corrosion is removed and then coat them with petroleum jelly.

Allow rest

Never use the electric starter more than 30 seconds at a time, and then allow approximately two minutes between cranking cycles. The brief "rest period" allows the battery plates to cool and allows the battery to recuperate sufficiently to again deliver a surge of power.

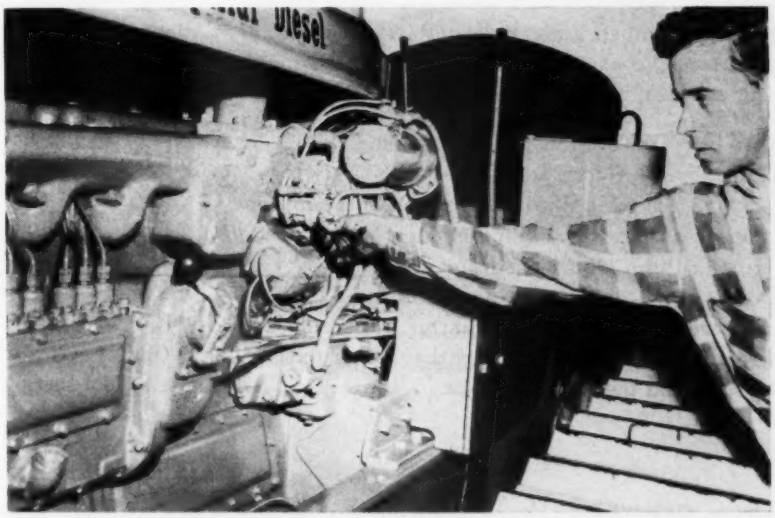
After emergency use or accidental energy loss, such as leaving the lights on overnight, it might be necessary to "quick-charge" the battery. No particular fault can be found with "quick charging" or "hot charging" methods if the maker's instructions are closely followed.

Prevent freezing

In cold weather, never add water at the end of a day's run. Instead, add water in the morning just before starting or right after starting. In this manner, the water will be thoroughly mixed with the acid by the end of the day's run and freezing of the electrolyte will be prevented.

Storage procedures

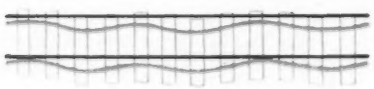
Storage batteries which are not in use will lose their strength gradually (the rate of discharge depends upon the temperature) when left on the shelf or stored in machines for an extended period of time. The higher the temperatures, the greater the loss of energy. To keep them up to strength and ready for use, recharge any batteries in storage when their specific gravity drops to 1.240. A fully charged battery will show a hydrometer reading of 1.270 to 1.280.



CRANKING POWER for diesel engines in all kinds of weather is often dependent on electrical power supplied by storage batteries. In many cases even a gasoline starting engine is equipped with an electric starting motor for greater convenience. Proper battery care will pay off in savings in time and effort.

. . . the story behind the

NORDBERG Smoothin' OPERATION



The SMOOTHIN' team is made up of a Nordberg Trak-Surfacer with shortened wire (50′0″), Tamping Power Jack, Gang Tamper, Line Indicator, and Trakliner. Gang personnel consists of three machine operators, a man for marking ties to be tamped, and a foreman.

HOW IT WORKS: Propelled by the Tamping Power Jack, the Trak-Surfacer, adapted for SMOOTHIN', is moved along the track until a low spot is encountered in either or both rails. Sighting is done by wire and low spots are indicated by movement of pointers on the Power Jack. The operator then moves the Jack to the nearest joint, center or quarter, raises the tie to correct the low spot by bringing the pointer to zero on the scale and then tamps the tie.

Following behind the Trak-Surfacer a man indicates, by code, the ties to be tamped and whether the ties must be tamped on one or both ends. Then, the Gang Tamper tamps the ties.

Tangent track is then lined with the Trakliner and Line Indicator. The foreman supervises the overall SMOOTHIN' operation and assists in the lining of curves.

On a recent demonstration, 473 rail lengths of track (approximately 3½ miles) were smoothed in 14 working hours, in which 46% of the ties were tamped.

Call or write for further information on this latest use of Nordberg *"Mechanical Muscles."*

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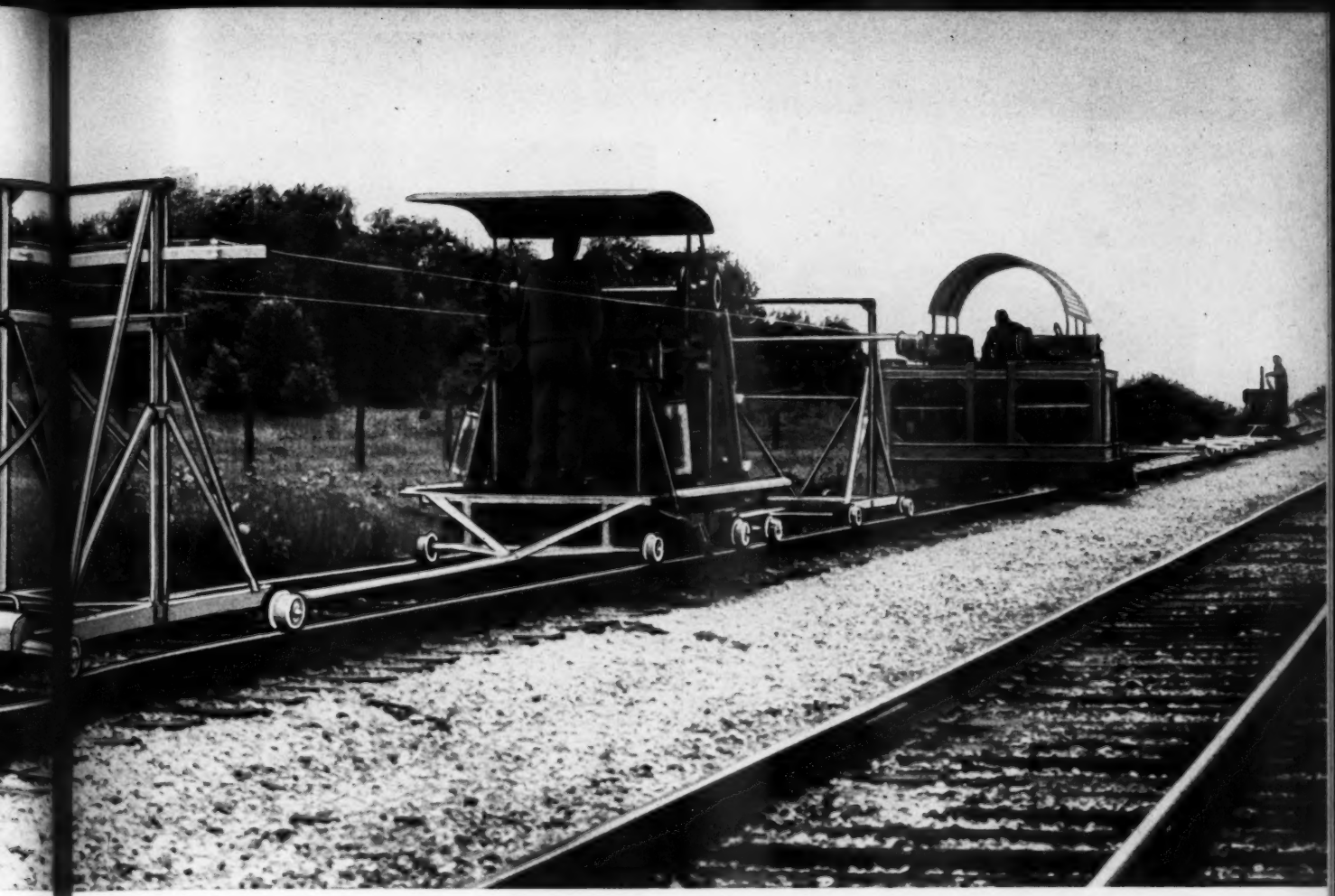

● Over-all view of a SMOOTHIN' operation showing the Nordberg Trak-Surfacer, Tamping Power Jack team, Gang Tamper, Line Indicator and Trakliner.

● Close-up view of the Nordberg Gang Tamper, with split tamping heads.

● View of the Nordberg Trakliner and Line Indicator used for lining the track.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

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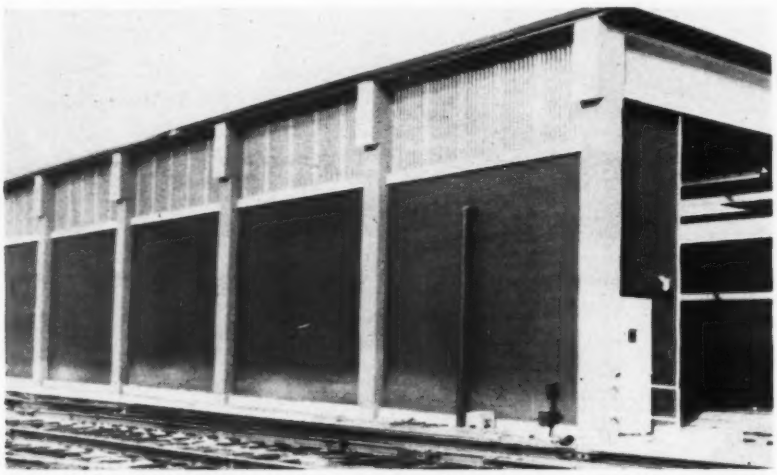
NEW BRIDGE carrying the Tennessee Central across a highway near Masonville, Ky., was supported on concrete pile piers with concrete caps to avoid excavating through 25 ft of unstable material. Another feature: Penta-treated ties and guard rails.

GREEN ALUMINUM paint is being applied to more than five miles of elevated structure by the New York Transit Authority, including 31 stations and 40 bridges. The coating is based on specifications developed by the Aluminum Company of America.

News briefs in pictures



CAR SERVICE BUILDING on the B&M at Somerville, Mass., features Structoglas corrugated fiberglass paneling in the side walls. Use of the panels, it is said, cut installation and maintenance costs, enhanced the appearance and allows plenty of light.

ALUMINUM girder-type highway bridge, the first of its type to be built anywhere, was erected recently at Des Moines, Iowa. It is a 222-ft welded structure, continuous over three piers, and was built to demonstrate the structural and fabrication qualities of aluminum. The project was jointly sponsored by the Iowa State Highway Commission and three producers of aluminum—the Aluminum Company of America, Kaiser Aluminum & Chemical Corporation and Reynolds Metals Company. The structure is 36 ft wide and has a 30-ft roadway of reinforced concrete. It was fabricated by the Pullman-Standard Car Manufacturing Co.

A-W Hydraulic Crane transports two 2500-lb. wheel and axle sets four times as fast in GM&O's Venice, Ill., repair yards. One set is carried on the boom, the other on front-end load-carrying platform.

Gulf, Mobile & Ohio nets $40,000 savings annually with two Austin-Western Hydraulic Cranes

Two Austin-Western Hydraulic Cranes do the work of 10 men and a tractor in Gulf, Mobile & Ohio's Bloomington and Venice, Ill., repair yards.

GM&O reports," ... we have an annual gross labor and equipment saving of $50,000* because of the A-W cranes. The cost of our two cranes is estimated at less than $10,500 annually for both. Deducting the cost of the small tractor, crane costs are reduced to less than $10,000. The net saving in the cost of car repairing in a year is over $40,000!

Safety factor important

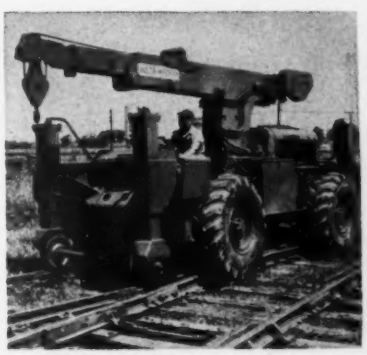
"Changing car doors and setting couplings, difficult and dangerous hand operations, are now done safer and faster by crane. The factor of extra safety alone probably justified use of the A-W, even if it did not also make such worthwhile savings.

"When our 25-ton locomotive crane was out of service for 10 days, the 5-ton A-W unit handled most of the essential jobs. During 1957 the A-W crane worked two shifts daily for 5 months rebuilding 400 hopper cars. Equipped with magnets on the 18-ft. telescoping booms, the A-W's keep the yards free of dangerous scrap metal.

Maneuverable, versatile

"The A-W is so maneuverable that it makes its way readily anywhere under all conditions. In spite of snow 18 in. deep and temperatures 6° below, the A-W stayed on the job in the unpaved repair yards at Venice. With all-wheel steering it can turn in less than its own length. Boom swings a full 360°. With all-wheel drive the A-W easily runs over raised rails.

"Several times a day the crane is used to spot cars, nosing them along with the boom end. There seems no limit to the chores we can do faster and more safely with the Austin-Western Hydraulic Crane!"



Equipped with Rail Crane Attachment, A-W crane can work on-or-off-track with equal ease.

**For complete information about the self-propelled A-W Hydraulic Crane in GM&O's operations, write today for Certified Gould Report No. 5801.*

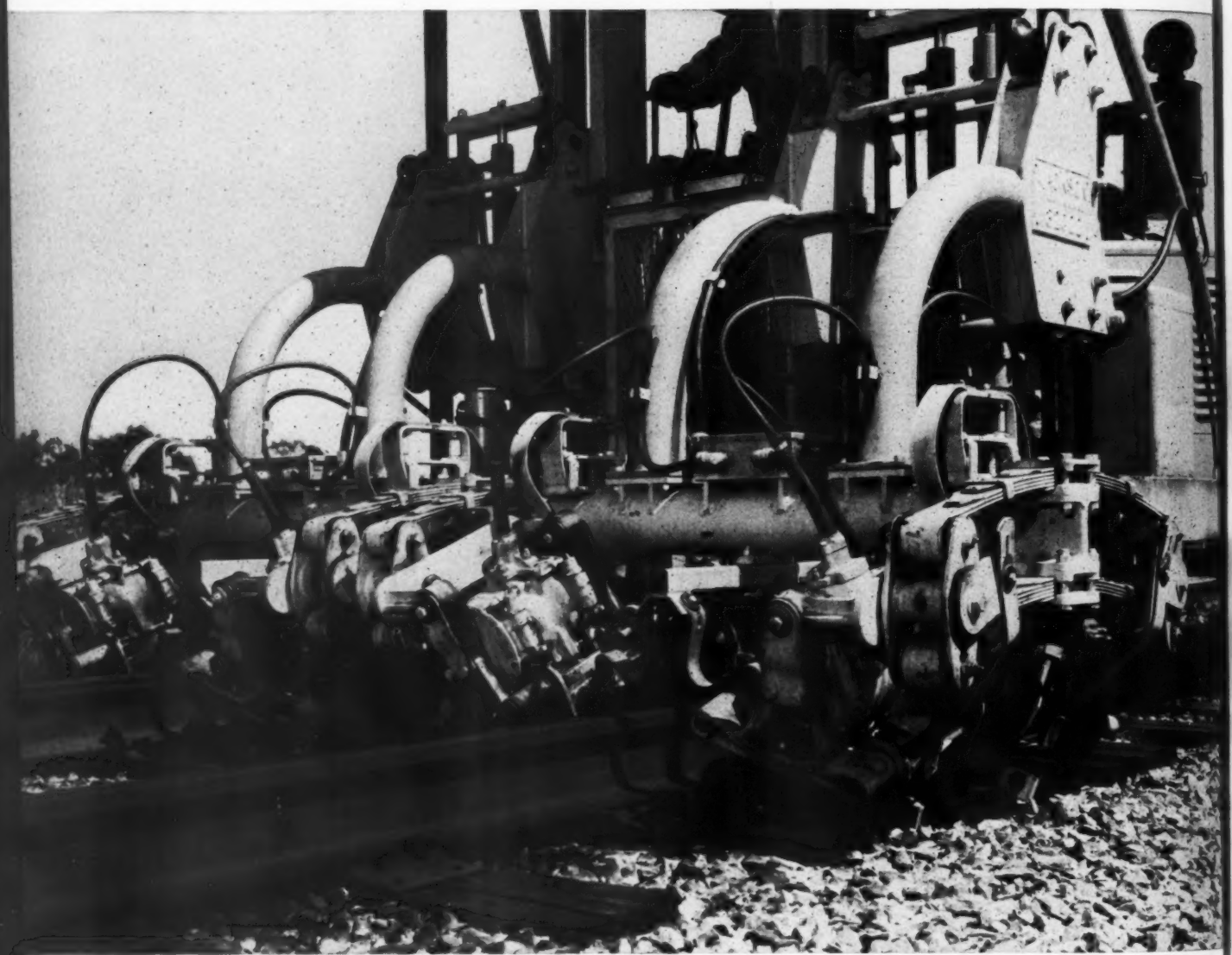
Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

BALDWIN BLH LIMA-HAMILTON

For 1959 The **CHAMP** *hits even harder*



THE JACKSON TRACK MAINTAINER

already judged by the vast majority of Track Chiefs to be the most efficient machine of its type, enters the 1959 spotlight with much more powerful motors operated by a single-generator, simplified power plant with more than ample capacity. Its greatly increased vibratory energy dominantly extends this machine's matchless uniformity of ballast consolidation and supreme versatility over the entire range of production tamping. Fewer insertions per tie are required with proportionate gains in hourly footage. Maximum ballast consolidation right under the rail is constantly maintained.

Again in '59 the JACKSON TRACK MAINTAINER is by far your best bet. Write, wire or phone for any information desired. Knowing the facts, you'll surely want to include it in your '59 recommendations.

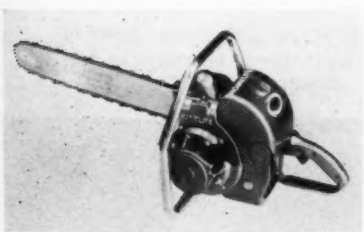
JACKSON VIBRATORS, INC.
LUDINGTON, MICHIGAN

Telescopic boom on . . .

Truck hoe-shovel

AN ALL-HYDRAULIC combination hoe-shovel has been made available with ½-cu yd capacity. Designated the Hydrohoe-Hydroshovel, this unit may be mounted on any new or used suitable commercial motor truck, and can be moved to the job at 50 mph. It is available as a hoe only, without basic crane or hoist machinery, or it can be made so as to allow quick field conversion to crane or clamshell work.

Several outstanding features are claimed for this machine. It has three hydraulic circuits, each supplied with a separate pump, to provide 90 hydraulic horsepower. Differential and selector valves allow the operator to concentrate the power where it is needed. A total of 189,000 lb of ram force is provided by the combination of crowd-down, dig and wrist-action rams. A solid digging platform is provided by four hydraulically controlled outriggers. A dipper-wrist action ram generates as much as 10 tons of digging force at the dipper lip. The boom telescopes up to four feet. Six hand levers and two foot pedals comprise the operating controls and three motions may be operated simultaneously. *Bucyrus-Erie Company, Dept. RTS, South Milwaukee, Wis.*



Fast cutting claimed for . . .

Chain saw

WEIGHING 18 lb the new Homelite "Zip" chain saw is claimed to have big saw quality for low cost. It is a direct-drive, gasoline-operated saw with features that include the Homelite short-stroke engine design, all-position diaphram carburetor, automatic clutch and safety chain guard, and large air filter and fuel tank. The manufacturer states that the Zip will cut an 18-in tree in 18 sec and that the saw has enough dependable power for either part-time cutting or full-time use. Blades are available in sizes from 12 to 21 in. *Homelite, Dept. RTS, Port Chester, N. Y.*

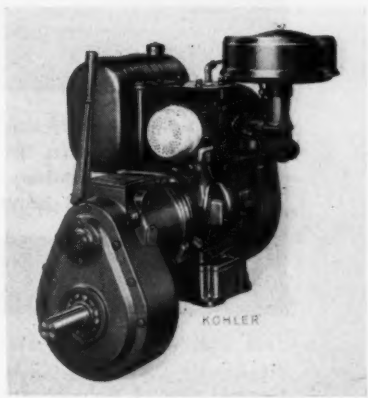
Steelwork cushioned by . . .

Bridge bearing pads

A RESILIANT, conformable cushion between steelwork and masonry abutments is the purpose of a new product designated J-M Bridge Bearing Pads. The pads are said to be durable, rugged slabs made of selected asbestos, special compounds and wire reinforcement. Because of their inorganic asbestos construction, the pads are not prone to deterioration and are not affected by most chemicals or long exposure to the elements, according to the manufacturer.

It is said that samples of the new pads, when tested, withstood loadings of over 20,000 psi without a single failure. Also, after being subjected to rigorous tests for compression and recovery, they have satisfied requirements and received approval from numerous state and municipal road commissions and bridge divisions. *Johns-Manville Sales Corporation, Dept. RTS, 22 East 40th St., New York 16, N. Y.*

MODEL KV91 for heavy duty use.



MODEL K331CR for heavy load start.

Many uses for . . .

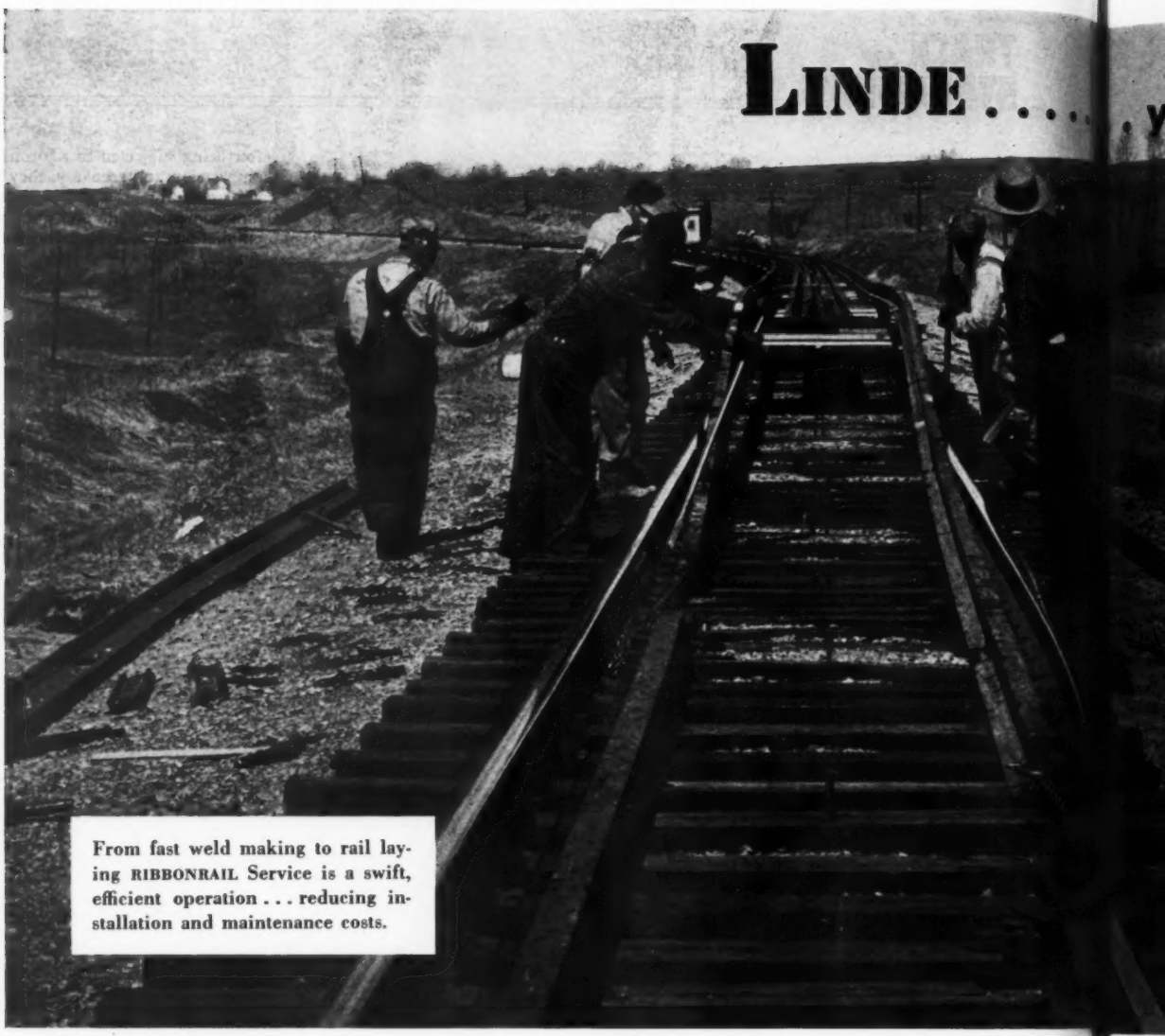
New gasoline engines

TWO new Kohler gasoline engines have been introduced. Model KV91 is a 4-hp compact vertical-shaft engine weighing 41 lb, which is designed for heavy-duty applications. It is a short-stroke, four-cylinder, air-cooled engine, pressure-lubricated and of lightweight cast iron construction.

Model K331CR is an air-cooled, short stroke, four-cylinder engine rated at 12.5 hp at 3200 rpm. It is designed for applications requiring heavy starting loads and low power take-off speeds. The engine has a clutch reduction assembly which combines a dry-type clutch equipped with anti-friction ball bearings and a chain driver

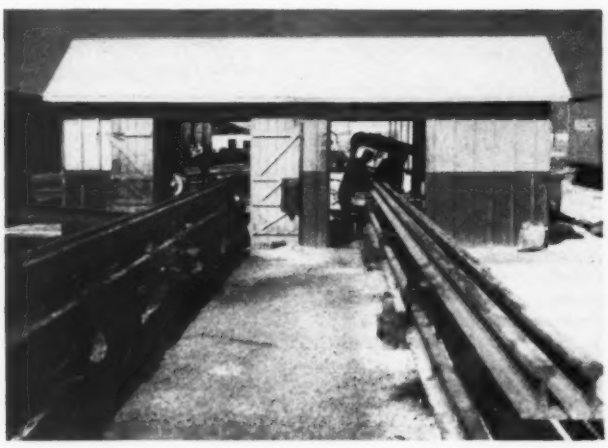
(*Continued on Page* 44)

LINDE . . . .



From fast weld making to rail laying RIBBONRAIL Service is a swift, efficient operation . . . reducing installation and maintenance costs.

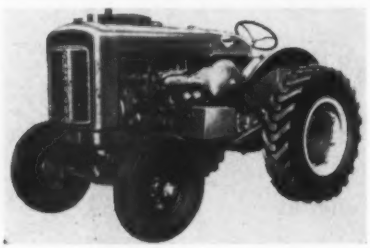
General view of Wabash's dual rail welding setup. Here a double line of rails enters rail-end preparation shed. ▼



Here, rail ends are cut and cleaned prior to welding. Single saw speeds operation by preparing 4 ends simultaneously. ▼

(*Continued from Page* 41)

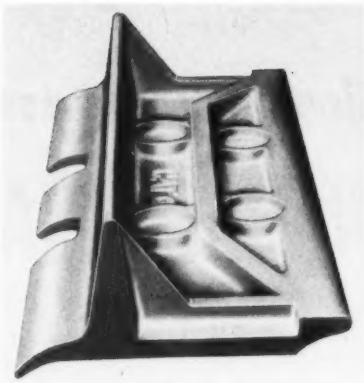
reduction gear with the power take-off shaft mounted on roller bearings. Reduction ratios of 2:1, 3.25:1 and 3.79:1 are available. *Kohler Company, Dept. RTS, Kohler, Wis.*



Diesel power for . . .

Tractor compressors

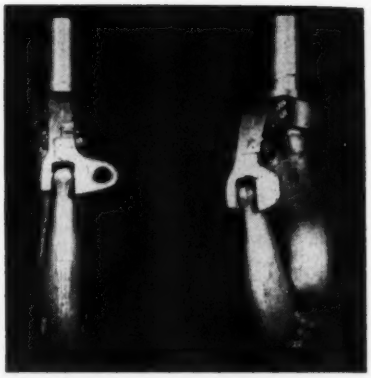
A FULL DIESEL-POWERED 125 Pneumatractor has been announced, which utilizes the Pneumadiesel en bloc construction. The diesel features are available in both the standard and heavy models. New features of the diesel 125 Pneumatractor include a fuel pump of the distributor type, the use of 12-volt starting equipment, using the well-known principle of starting on gasoline, preheating the entire engine and then switching to full diesel. *Schramm, Inc., Dept. RTS, 900 East Virginia Ave., West Chester, Pa.*



Gets harder while working . . .

Tractor track-shoe

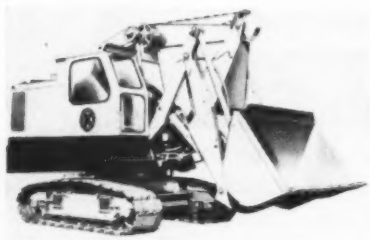
CAST from a specially alloyed-steel containing 12 to 14 per cent manganese, a new track shoe is now available for Caterpillar D8 and D9 tractors. Designed primarily for work in rock and slag the new grouser shoe, the manufacturer claims, becomes work-hardened under the constant pounding or shearing-type wear that is encountered in rock operations. Resisting wear better than standard steel track shoes the manganese shoe is initially ground smooth on the rail side to provide a smooth, secure fit. It is available in the standard widths of 22 and 27 in. For grouser applications in sand and earth, the manufacturer recommends the standard steel track shoe. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*



New locking mechanism for . . .

Hoist-hook gate

DEVELOPED for use on large-size hoist hooks, a new locking mechanism for gates of the Bullard Safety Hook line is now available. It is claimed that the Tip-Lok attachment locks the safety gate over the tip of the hook, creating greater strength in the gate and thus keeping the gate closed and the load secure. Tip-Lok gate and locking mechanisms are made of cast brass with a stainless steel return spring. To assure the necessary strength the new mechanism has been added to safety gates on hook sizes 13, 14, 15, 16, 16A, 17 and 17A. The new Tip-Lok automatically lifts open and drops closed upon contact with the tip of the hook. The ring on the locking tip is optional and is used for remote operation. *E. D. Bullard, Dept. RTS, Sausalito, Calif.*



Speed-loading with . . .

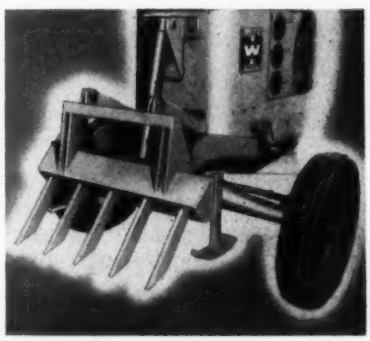
Crawler-type digger

ABILITY to dig and load while standing still is claimed for the new Koehring "Skooper." This is accomplished, says the manufacturer, by utilizing the fast swing of an excavator with a seven-foot independent crowding action. Job-condition tests are said to have shown that the diesel-powered "Skooper," operated with 70 hp, can load 400 tons per hour, amounting to 5.7 tons per horsepower. The machine has a cutting height of 17 ft 4⅝ in and a maximum clearance at the end of the dump of 9 ft 8 in. It is stated that the virtual elimination of track movement, plus smooth swing and crowd action, cuts operator fatigue to a minimum, allowing continuous full operation. The "Skooper" bucket is said to cut evenly up any angle of sloping bank, as well as on an accurate level grade. Crawlers can head into the digging or be set parallel to the bank. Versatility of the machine is enhanced by bucket capacities available from 1⅞ to 2½ cu yd, easy change-over to a ½-cu yd hoe, ¾-cu yd dragline and a 10-ton lift crane. Job applications recommended by the manufacturer include material rehandling, quarry and underground work, basement digging, coal and slag loading and removal of pavement. *Koehring Division, Dept. RTS, Milwaukee 16, Wis.*

Versatility claimed for . . .

Grabs and grapples

A NEW series of grabs, grapples and orange-peel buckets is now available designed for handling pulpwood, logs, stumps, rocks, riprap, boulders, scrap metal and other hard-to-handle materials. Features of the new line include heavy welded construction, oversized pins and bushings, recessed Alemite grease fittings, up to four parts of line reeving, large, cast steel sheaves and positive socket and wedge cable attachments. It is claimed that any crane equipped to handle clamshell buckets can handle the new series of grapples. *Erie Strayer Company, Dept. RTS, Rudolph Ave. and NKP RR, Erie, Pa.*



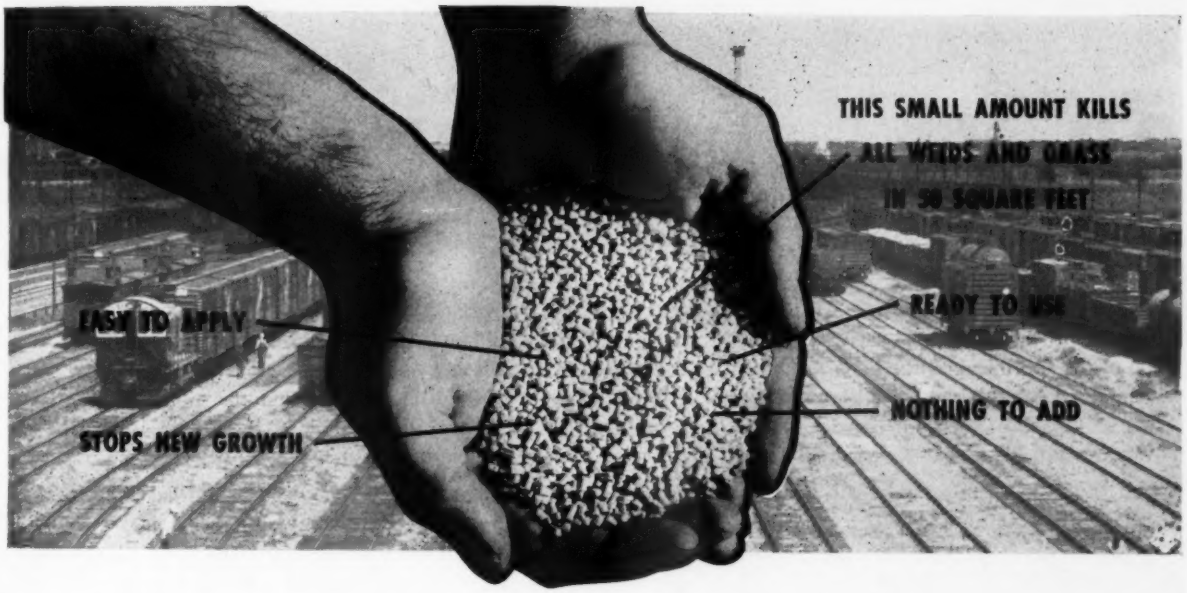
For use on motor graders . . .

Scarifier attachment

THE LATEST attachment developed for the Huber-Warco Maintainer is a five-tooth scarifier. It is said to be engineered for maximum efficiency in medium and light-duty scarifying of blacktop, stone, gravel, dirt and similar materials. It has a swath width of 33 in and a scarifier pressure of 2,400 lb.

The manufacturer states that the scarifier may be quickly attached to the same hydraulically controlled lifting unit as the bulldozer and snow-plow attachments. Write *Huber-Warco Company, Dept. RTS, Marion, Ohio.*

CHLOREA® GRANULAR
WEED & GRASS KILLER



CHLOREA GRANULAR is a new form of Chlorea weed and grass killer. The dry, dustless pellets require no mixing . . . they are ready and easy to apply with simple equipment. These advantages are combined with the powerful "kill all" effectiveness already demonstrated by Chlorea in powder and liquid forms (used on railroads for the past several years).

Here are the important facts about Chlorea Granular:

1. Kills ALL weeds and grasses . . . stops new growth for a year or more.
2. Particularly intended for use in locations where large scale spray application is impractical . . . such as freight yards, terminals, storage yards, under bridges and trestles, around warehouses, stations and other similar places.
3. Easy to use . . . may be applied with any mechanical type spreader used for granular materials; or may be broadcast by hand.
4. Low application rate . . . about 400 pounds to the acre . . . less where only annual vegetation is involved.
5. Contains 3 proven chemicals . . . this combination kills deep rooted weeds and grasses, as well as shallow-rooted grasses, weeds and annual seedling growth.
6. Is non-poisonous and does not create a fire hazard when used as directed.

CHIPMAN CHEMICAL COMPANY
Bound Brook, New Jersey

SEND FOR FREE SAMPLE PACKET

CHIPMAN CHEMICAL COMPANY, INC.
Dept. 6B, Bound Brook, N. J.

Please send free Chlorea Granular sample and bulletin.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____

New Santa Fe culvert is a combination of Armco Liner Plate and MULTI-PLATE

Beveled Armco Structure Installed Under Santa Fe Tracks Without Traffic Delays

A new drainage opening had to be made under the Santa Fe main line near Lang, Kansas. Requirements for the structure included beveled ends and complete installation without interrupting rail service.

To do the job without traffic delays, Santa Fe engineers decided to tunnel under the track with 42 feet of 168-inch-diameter, 5-gage Armco Liner Plates. End requirements were met with 12-foot-long sections of Armco MULTI-PLATE® Pipe, beveled 1½:1 to fit the slope. The MULTI-PLATE end sections were securely attached to the Liner Plate to assure an integral structure.

This job is typical of the way many railroads solve difficult drainage problems with Armco Corrugated Metal Structures. For more details on the Santa Fe job or complete data on Armco Liner Plate or MULTI-PLATE, just fill out and mail the coupon. Armco Drainage & Metal Products, Inc., 4008 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Liner Plates assure safety for both workmen and traffic during tunneling operations.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
4008 Curtis Street, Middletown, Ohio

Please Send Me
☐ Railroad Engineering Report 2-57 on Santa Fe Job
☐ Data on Armco Liner Plate ☐ Data on Armco MULTI-PLATE

Name_____
Railroad_____
Street_____
City_____ Zone____ State_____

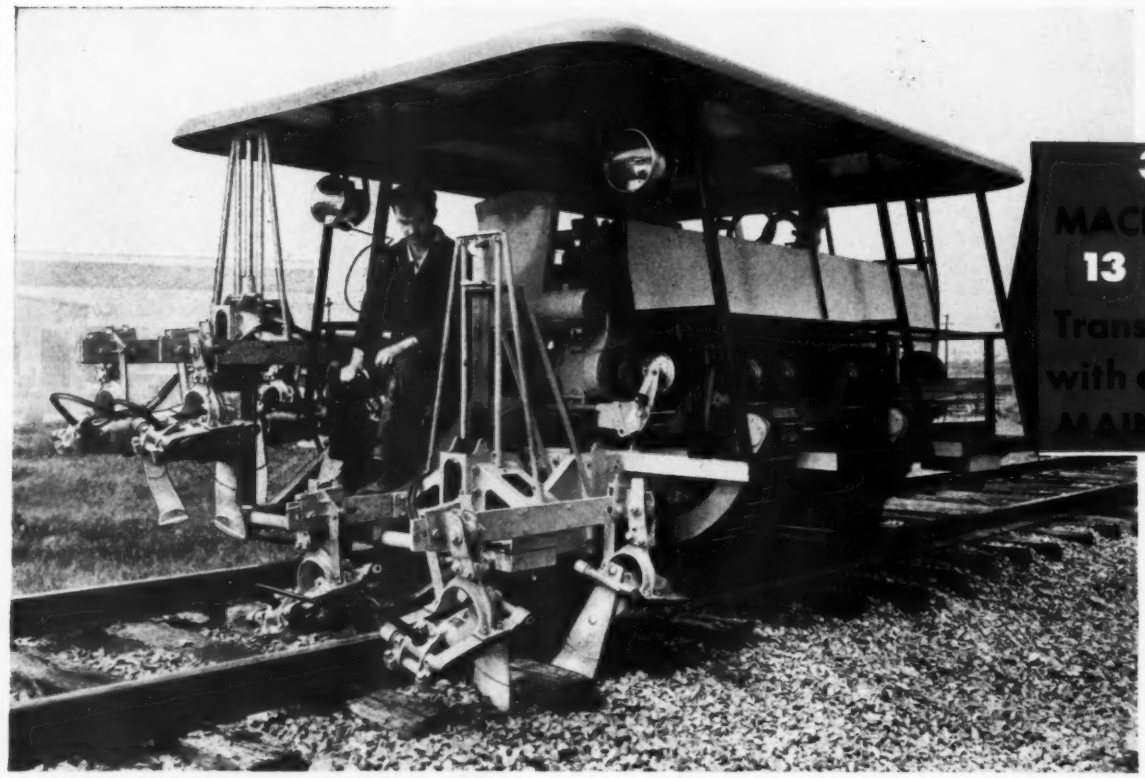
ARMCO CORRUGATED METAL STRUCTURES

ARMCO®

NEW CONCEPT IN TRACK

Tamper MULTI-GANG* PACKAGE UNIT

Greatly Lowers Maintenance Costs



A COMPLETE UNIT—all three machines (or other equipment) are housed in Main Car.

RAPIDLY REMOVED FROM TRACK by Crawler Set-Off . . . in a matter of seconds.

POWER DOWNFEED OF INDEPENDENT WORKHEADS . . . operates easily.

HYDRAULIC PROPULSION . . . the Main Car travels up to 25 MPH.

THESE HYDRAULIC MACHINES are *easily* loaded on or unloaded from Main Car, by hydraulic Tail Rack.

LOOK WHAT THE MULTI-GANG WILL DO:

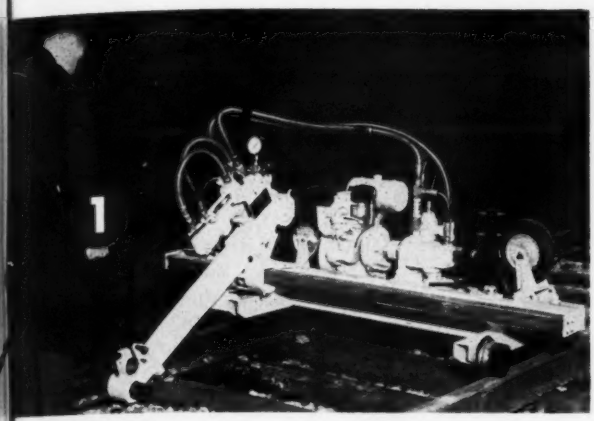
surface • line track • pull spikes without bending • remove or insert ties • torque controlled bolting • drills rail
MULTI-GANG'S Main Car is 171″ long x 113″ wide x 84″ high.

TAMPER MULTI-GANG PACKAGE UNIT

consists of:
Main Car with Power Downfeed Tampers and Crawler Set-Off
Hydrillbolter
Spike Hydrejector—Tie Hydrenewer
Comboliner

MULTI-GANG UNIT EXTENDS THE TRACK SECTION

SECTION MAINTENANCE



HYDRILLBOLTER* (*Model* BD)

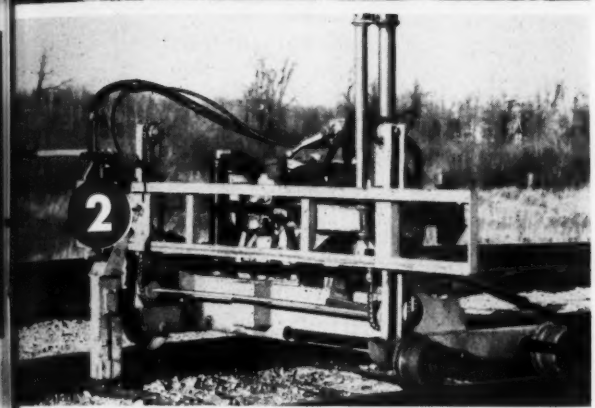
Combination Bolter and Rail Drill

Hydraulic Transmission
Minimum Mechanical Replacement Parts

BOLTER
- single control lever, manned by one operator
- automatic change from high speed, low torque, for 'running up' nuts to low speed, high torque for nut tightening
- handles nuts on either side of both rails

DRILL
- drill attachment adapted in less than 2 min.
- manned by one operator
- easily adjusted for different rail sizes
- drill bits quickly interchanged

HYDRILLBOLTER can be removed from track by two men.



SPIKE HYDREJECTOR*

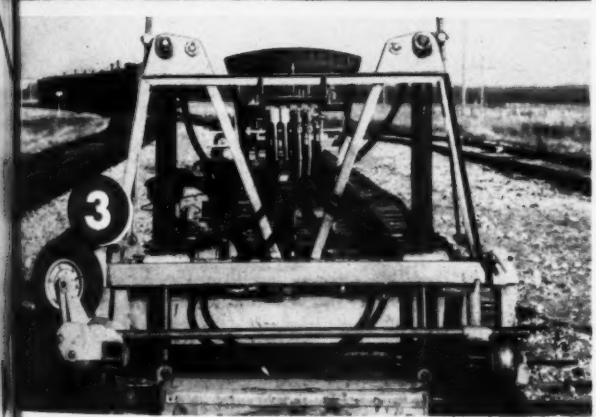
TIE HYDRENEWER* (*Model* PR)

Combination Spike Puller and Tie Renewer

pulls spikes without bending • lightweight • completely hydraulic • easily operated by one man.

Tie Renewer is adapted to Spike Puller in seconds
No disturbance of track line or surface
Renews without digging out tie ends

Removed from track by one man.



COMBOLINER* (*Model* JL)

Combination Powered Jack and Track Liner

powerful • lightweight • compact

- 10,000 lbs. thrust to throw the track in either direction
- simply insert lining anchors and slide out wheels to line the track
- lifts track to 10 inches, rail dogs engage automatically
- turntable allows easy pivoting
- cross level indicator reads directly in inches of elevation
- no wheels, axles to interrupt view of rails

Easy to remove from track.

***ORGANIZE . . . MECHANIZE . . . ECONOMIZE* with MULTI-GANG**

For full information, contact

Tamper LIMITED
RAILWAY DIVISION

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* *Patents Pending*

Concrete car-retarder foundations

Are concrete foundations desirable for supporting car retarders? If so, how can they be kept in line and surface? If not, what is the best formation?

Slab on piling

By R. H. Beeder
Assistant Chief Engineer, System
Atchison, Topeka & Santa Fe
Chicago, Ill.

The subgrade characteristics and the type of hump yard under construction are the most important factors in determining the type of foundations to be used for car retarders. These foundations can be of ballast, concrete slabs or piles.

A well-compacted subgrade with good drainage could support car retarders set in ballast. There is a number of such installations that are performing satisfactorily. When such an installation gets out of surface, about the only difficulty we have experienced has been the lack of space for tamping due to our inability to get in and around the retarder parts with our tamping tools. Such an installation can be lined without too much difficulty. Ordinarily, the ballast type of foundation construction is only used for retarders in a smaller hump yard where traffic is light and subgrade and natural ground conditions are excellent with respect to stability.

When the retarders are placed on a fill or subgrade where unequal settlement is a possibility, a reinforced-concrete slab can be used for the foundation with sawed timber ties to support the retarders. If some unequal settlement should occur, the track can be surfaced by shimming or adzing the ties. The track can also be lined by moving the ties in relation to the slab. If appreciable settlement takes place the slab can be raised by means of pressure grouting.

If the subgrade or fill is composed of unstable material, such as a plastic clay or silt, the retarders should be supported on a pile foundation. A reinforced-concrete slab can then be cast over the piles and the retarders placed on ties. Piles driven on 5-ft longitudinal centers under each rail should prove satisfactory. This is the type of foundation which will hold both the surface and cross level of the retarders.

In those hump yards having automatic speed control, the track tolerances that must be held are about ¼ in. in 40 ft for surface and ⅛ in for cross level. Of course the hump yard equipped with automatic speed control is normally the most important and busiest, with continuous traffic through the retarders. These factors in themselves generally give economic justification for the installation of the best type of retarder foundations, which includes concrete slab and piles.

Concrete and timbers

By C. R. Riley
Chief Engineer
Baltimore & Ohio
Baltimore, Md.

We have found that car-retarder manufacturers have been reluctant to make recommendations regarding foundations for their equipment. Some years ago we built one primary retarder on a concrete foundation and one on timber ties supported on a crushed stone base, 4 ft deep, at our classification yard in Willard, Ohio. At this same location, one group of secondary retarders was placed on concrete foundations and another group was supported by standard timber-tie construction. Shortly after this yard was placed in service, timber blocking was added at the primary retarder with the crushed stone base to maintain the line and surface better. The grade and alinement of all other retarders at this location have been relatively simple to maintain and their performance has been satisfactory.

From our observations we are convinced that the most desirable foundation for retarders is to use a concrete slab or mat with longitudinal timber stringers and ties to support the primary retarders and standard timber tie construction to support the secondary or group retarders. The concrete slab foundation under the primary retarders, when placed on a well-compacted fill, distributes the load, and, with proper drainage, reduces settlement to a minimum, resulting in low maintenance costs. The infrequent lining and surfacing which might be required can readily be made in the timber stringers and ties at these retarders.

Use stone ballast

By G. P. Hayes, Jr.
Engineer of Construction
Richmond, Fredericksburg & Potomac
Richmond, Va.

I do not think that concrete foundations are desirable for supporting car retarders. Once the retarder has been placed on the concrete foundation, any maintenance operations to the track on either side of the retarder require that the existing grade be maintained. This necessitates the cleaning of the ballast under the ties and replacing it without disturbing the grade. Also, it has been my experience that the concrete foundation will not stand up, over a period of years, under the constant impacts it receives from heavily loaded cars as well as locomotives. Car retarders constructed on a concrete foundation cannot be surfaced except by shimming the ties. At best, this is not a satisfactory arrangement. Also, car retarders on concrete foundations cannot be lined satisfactorily.

If the subgrade conditions under the concrete foundation are not practically perfect, I have found that, after several years of operation, the foundation has a tendency to start pumping due to water pockets. This pumping action ultimately results in the concrete cracking and the surface through the retarder being lost.

The proof of any type of construc-

Positioner holds anchor firmly against tie while mechanical hammer installs it accurately with a sledge-like blow. Special stop prevents overdriving.

Mechanical driver and Bulldog anchors give you

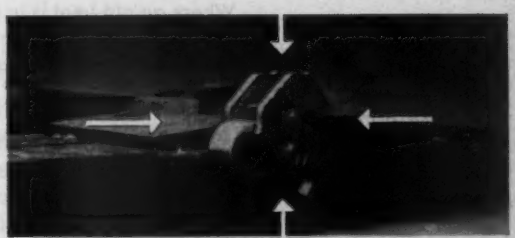
ALL THE HOLDING POWER YOU'RE PAYING FOR

True Temper's new mechanical anchor driver makes sure you get full benefit of the BULLDOG anchor's tremendous holding power.

Essentially a mechanized sledge hammer, the new driver weighs only 425 pounds. It positions each anchor snugly against the tie, then installs it quickly and uniformly to give you all the holding power you're paying for.

Because of its one-man operation, light weight and retractable setoff wheels, the mechanical driver is a fast, flexible, cost-cutting machine. Its speed and simplicity made it a top favorite at the National Railway Appliances Exhibition in Chicago.

Be sure you get the full story on BULLDOG rail anchors and machine application as pioneered by True Temper. Contact your True Temper representative, or write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio.



BULLDOG anchor has two-way grip

Two elements in the BULLDOG anchor — a resilient steel spring and a double-jawed clamp of hardened steel — create a positive two-way grip that actually multiplies and sustains holding power. Factory-assembled as one unit, the anchor is easy to ship, handle and install.

OTHER TRUE TEMPER RAILWAY PRODUCTS: Track Shovels • Ballast Forks • Weed Cutters • Hammers • Sledges • Scythes • Safety Rail Forks

TRUE TEMPER. BULLDOG RAIL ANCHORS

YOU CAN LOOK TO TT FOR LEADERSHIP

tion, or the answer to any question, can only be obtained through experience. At Potomac Yard the car retarders were installed in 1946 in the southward classification yard on concrete foundations. In 1947, due to water pockets under these retarder foundations, it was necessary to install an elaborate drainage system adjacent to the retarders and to grout the area under the retarders in an attempt to stabilize the subgrade.

In 1958, the southward classification yard is undergoing a complete rearrangement in order to install certain features of automation. As a result, the retarders had to be replaced. At the time of replacement the concrete foundations were found to be in a deplorable condition.

On the other hand, Model 29 retarders in the northward classification yard were replaced in 1947 with Model 31 retarders. These were surfaced on standard stone ballast using pneumatic tools. In the 12 years since these retarders were installed there have been no problems with either surface or line. The occasional irregularity in surface can be corrected with a retarder on stone ballast just the same as any irregularity in surface on the main track is corrected by normal track-surfacing operations.

Considering the fact that a retarder installation on stone ballast is much more economical initially and that subsequent maintenance is practically negligible, it is my opinion that stone ballast rather than reinforced car retarders should be installed on concrete.

Removing excess metal from stock rails

What is the best way to remove excess metal from stock rails—gouging rod, cutting torch, or heating and chiseling? Why?

Uses utility grinder

By A. D. Henninger
General Roadmaster
Soo Line
Minneapolis, Minn.

It is our practice to remove the excess metal from stock rails, switch points, frogs and railroad crossings with a utility grinder.

A periodical dressing off of excess metal will materially increase the life of the rails and reduces the chance of excess metal chipping off. This often occurs when the flow of metal is not properly maintained.

The use of a cutting torch is not practical since it softens metal.

Grinding is neater

By E. A. Anderson
Yard Foreman
Duluth, South Shore & Atlantic
Marquette, Mich.

Neither the gouging rod, cutting torch or heating and chiseling methods are the best ways to remove excess metal from stock rails. We use a rail-joint grinder to remove excess metal from stock rails and switch points and I think this is the best way. A small carriage (made in our shops), to which the grinding wheel is attached, is set on the stock rail and over the open switch point. The grinder operator moves the carriage back and forth along the stock rail until the desired amount of excess metal is removed. The carriage and machine are then reversed to remove the excess metal from the switch point.

By grinding off the excess metal a much neater job is accomplished. Also, the switch points are easily adjusted to the proper tension after the excess metal is removed.

How to remove old piles

Where an old bent is in the way of a proposed pier or new pile bent, how can the old piles be removed economically? Describe method and equipment used for this purpose.

Seldom removed

By C. E. Ekberg
Bridge Engineer
Northern Pacific
St. Paul, Minn.

It is very seldom that old piles can be removed unless penetration is extremely small. Consequently, two alternatives present themselves: First, relocate the new bent or pier to clear the existing pier; second, if the new pier must be located in the same place, support the superstructure on falsework by driving temporary piles outside of pier area and placing steel or timber beams to span the opening. After the falsework is completed and the span is supported thereon, remove the old pier and drive new piles between the existing piles. Then rebuild the pier. Sometimes it may be necessary to place falsework under practically the entire span when making a renewal in this manner.

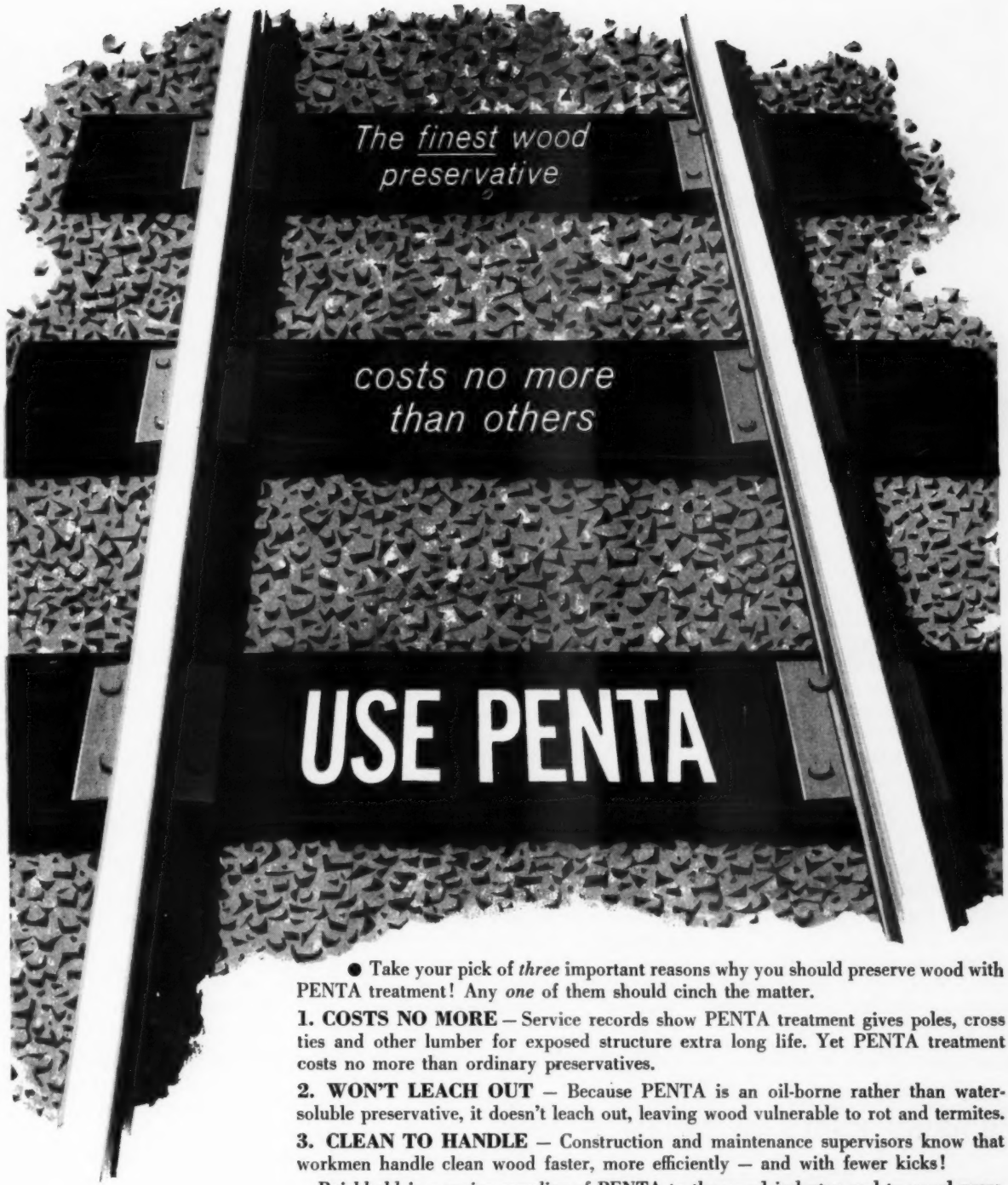
Occasionally it is possible to cut off the piles in the existing piers below the water level, where the wood is sound, and then rebuild.

A pier rebuilt in the same location, whether of timber or of concrete, becomes a larger structure than would be required if the pier could be built in the clear of any obstruction. This is due to the necessity for clearing away the old piles and also for overcoming the interference caused by the overhead structures which must remain in place during construction.

Tractor equipment

By J. M. Giles
Railroad representative
Caterpillar Tractor Co.
Peoria, Ill.

A Caterpillar D7 or D8 tractor, equipped with Hyster winches used in combination with double-luff hitches and pulling frames, can be an economical advantage in removing old



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piling from within the limits of new bents. Excavating to reach sound timber for making a hitch can be accomplished with the use of a Caterpillar D4 tractor equipped with a Hyster backhoe attachment to reduce hand excavating.

The paramount requisite in removing piling is to make certain that the hitch is on sound timber. Sufficient lagging, between the cable forming the hitch and the body of the pile, is a "must" to prevent squeezing. These two requisites must be observed rigidly, whether the force for pulling comes from a pile extractor load line on a crane, or a winch line of a tractor.

The use of a water jet or explosives to break the vacuum or skin friction is common in pile-removal operations. Their use is predicated on sail conditions and the method to employ will depend on whether the piling to be pulled are of the skin-friction or point-bearing type.

The removal of old piling within bridge pier limits requires the same preparation as for pulling piling from bents. Floating equipment, derricks, and mule derricks are some of the common prime movers used. To be added to this equipment are jets, explosives, clamshell or orange-peel buckets for excavation, and pile extractors.

Deposits on diesel shop ceilings

What can be done to reduce or eliminate the formation of fuel deposits on the ceilings of diesel shops? What is the best method of removing such deposits?

No easy method

By Division Engineer

Deposits on the undersides of roofs in shops and enginehouses result from the fumes which emanate from the exhausts of diesel engines while they are idling in these buildings. The amount of these deposits is proportional to the unburned fuel in these exhausts. This in turn depends on two factors—the quality of the fuel being burned and the adjustment of the engine. Generally speaking the greatest concentration of these unburned materials occurs in the exhausts of engines that are cold or are idling.

The primary reason that this equipment is being run in the shop is to permit the making of adjustments made necessary because of faulty over-the-road operation.

The perfect solution of this problem would be provision of shop ventilation which woud discharge these fumes directly outside the shop as they come from the engine exhaust. However, arrangements to handle fumes in this way are seldom found except in the more modern diesel shops where ventilation of the shop was provided for in the design of the structure. There are a substantial number of diesel shops which have been set up in existing or remodeled locomotive enginehouses where modern ventilating equipment cannot be economically installed. In such buildings the deposits from diesel fumes build up on the underside of roofs and must be removed periodically to reduce the possibility of fire breaking out.

We know of no method with the exception of steam cleaning which will effectively remove these deposits. This method is messy, but effective. For the most economical application, either permanent scaffold supports should be supplied to permit ready access to the under surface of the roof or ceiling of the shop, or use should be made of one of a number of truck-mounted aerial platforms which are now on the market. It will, of course, generally be necessary to close off that section of the shop being cleaned from the remainder of the shop area during cleaning operations. This will localize the range of falling debris and permit the remainder of the facility to operate.

I understand that one road used lightweight aluminum sheets to coat the ceiling area and that it was easier to remove the fume deposits from this material than from the normal ceiling surface. We have had no experience with this method.

Pumping joints on ballasted deck

When joints are pumping mud on a ballasted-deck bridge, what corrective measures can be used? Explain.

Renew ballast

By R. C. Mathis
Bridge Inspector
Illinois Central
Memphis, Tenn.

On main and high-speed tracks the most satisfactory corrective method is to strip off the ballast to the bridge floor and apply new ballast. Less important lines should be treated as required by local conditions. Usually this can be done by digging out the ballast from under the joint and adjoining ties and replacing it with clean ballast. This will satisfactorily correct the condition.

When necessary to strip all the ballast off the bridge, the usual practice is to do the work under a slow order. Crib the ties under the track as it is stripped for the full length of bridge. Then, unload new ballast, remove cribbing material and resurface the track.

On a concrete-slab deck bridge we usually strip the ballast to the bottom of the ties. All ballast from the ends of ties to the parapet wall is cast off, the weep holes are cleaned out, new ballast is unloaded and the track is surfaced with a sufficient raise in grade to insure proper distribution of load.

What's the answer? (cont'd)

Inspection necessary

By C. A. PEEBLES
Division Engineer
St. Louis-San Francisco
Enid, Okla.

The first question in connection with correcting churning joints on ballast deck bridges is: "What is causing the joint or joints to churn?"

The first order of business is a complete inspection and investigation. The following should be inspected:

Bridge—Determine if any member or joint is working excessively. Also check for bulging guard rail to determine if the bridge is permitting the ballast to shift in any manner.

Rail — Inspect for signs of running rail, rail-end batter, surface-bent rail, and/or mismatched rail.

Ballast—Examine to determine gradation, amount under ties, full cribs and cleanliness.

Joint bars—Inspect for loose bolts, bar wear and worn fishing surface.

Joint ties—Look at condition and tie size.

This inspection should be supplemented with information and ideas from others, depending on who is endeavoring to correct the condition. The roadmaster, track foreman, general bridge foreman, bridge inspector and division engineer, all have experience, know how, information and ideas which may not only be useful but also necessary in the solution.

Several measures

By O. D. ROACH
Track Foreman
Pennsylvania
Walton, Ind.

There are several answers:

(1) Relocate joints on bridge and weld same.
(2) Remove old ballast from the bridge.
(3) Open all drainage outlets and keep open.
(4) Fill in with good clean crushed stone, not less than No. 4 size, and raise track to a good surface.
(5) Good crossties under joints are very important in holding surface and line and gage.

Not much trouble

By O. H. CARPENTER
General Roadmaster
Union Pacific
Pocatello, Ida.

Generally speaking, we do not have too much trouble with ties pumping on ballasted-deck bridges as the ballast ordinarily extends to the deck slab of the bridge. This prevents pumping of mud from the subgrade through the ballast, which is one of the major causes of pumping track.

I presume, in such cases, that the dirt has been carried in by equipment, or blown in from adjacent fields, in sufficient quantities to fill the voids and block the drainage. When such a condition occurs, the only ways to correct it would be either to dig out the fouled ballast and replace it with new ballast, or to clean it by some method and replace it in the cribs.

If the joints are pumping, due to

What's the answer? (cont'd)

batter, chipped rail ends, or worn condition of joints and fittings, these conditions should be corrected before renewal of the ballast.

Where the track is pumping during wet weather, under conditions where voids have been filled with dirt or other fine materials, this condition sometimes is aggravated by oil leaching from treated ties and mixing with the five materials surrounding the ties. This creates a condition where water will not drain away. This condition might be prevented by using ties that are not treated by the oil method. This will not prevent pumping but it will delay the start of this condition for a long time.

All hand work

By R. R. MAHON
Supervisor of Track
Pacific Electric
Los Angeles, Calif.

When joints are pumping mud on a ballasted-deck bridge it is an indication of very badly fouled ballast. The logical solution is to remove all of the fouled ballast and replace it with new.

This, of course, requires some planning as to the procedure to be used, and this is affected by the length of the bridge.

The method of removing the fouled ballast to the deck of the bridge is generally a hand-tool job. Pneumatic digging tools cannot be used, when nearing the decking of the bridge, as they might damage the decking. When the fouled ballast is removed, secondhand bridge stringers should be installed not only to support the track during the digging operation but also to keep the track open for traffic. While the track is being supported on the stringers, a long board should be nailed to the ties at their proper spacing. This will keep the ties from slewing account of the rail running, or other factors.

The number of bridge stringers required depends upon traffic conditions. The lengths of the stringers will vary with local conditions. The timbers are placed under the track between the bottoms of the ties and the deck of the bridge.

After the fouled ballast is removed,

What's the answer? (cont'd)

about four inches of dry dirt, cinders or waste material having a rock content, should be placed on the decking. This permits drainage and provides a mat and binder to keep the ballast from shifting and rolling.

The new ballast can be dumped from a ballast car directly on top of the stringers. The stringers are to be removed during the raising and tamping operation. It is also necessary to stock pile some ballast at each approach to the bridge so as to have a sufficient quantity of ballast on hand for placement when the stringers are removed.

When working on a job of this kind it is also wise to change out any ties that may need renewing or to make a 100 per cent tie renewal.

To the editor

Suggestions for solving the porcupine problem

In this space in the September issue we printed a letter from C. J. Morrell, vice-president and general manager, St. Johnsbury & LeMoille County, Morrisville, Vt., complaining that porcupines were causing damage to several lattice-covered wood bridges on his road. Mr. Morrell said that the animals were "severely gnawing the wooden members."

Two readers have now come forward with suggestions for solving this problem. Wesley M. Martin, division engineer, Maine Central, Bangor, Me., has sent us a carbon copy of a letter he wrote to Mr. Morrell, offering a suggestion for solving the problem. We quote: "I just recently was talking to a friend of mine who is having trouble with porcupines getting into his camp. He told me he had tried everything without success until last year when, before closing his camp, he sprinkled kerosene around in various places. Up until now, the porcupines have stayed clear of the place. In applying the kerosene he did not soak the wood; it is apparently the odor of the kerosene that keeps the porcupines away."

Another helpful (?) suggestion is contained in a letter addressed to the editor from Dwight A. Smith, Jr., general manager, Springfield Terminal Railway, Springfield, Vt. The way they dispatch porcupines in Springfield, according to Mr. Smith, is "to hit 'em on the nose with a good heavy stick." But the problem, as Mr. Smith sees it, "is to tell Charlie how to sneak up on the porcupine without letting him know of your intentions."—Editor

Biographical briefs (cont'd)

(*Continued from page* 10)

Harold W. Walbright, who has been promoted to crossing engineer of the Norfolk & Western (announced elsewhere in this issue) entered the service of this road as an axeman in Portsmouth, Ohio, in January 1947. He worked successively as chairman, rodman and inspector and was promoted to assistant engineer at Roanoke, Va. in September 1957, the position which he was holding at the time of his recent promotion.

Alvie W. Wright, who was recently promoted to track supervisor on the Southern at Greeneville, Tenn. (announced elsewhere in this issue), was born in Alabama. He entered the service of the Southern in February 1927 as a section laborer at Huntsville, Ala. In September 1936, he was appointed foreman at Chase, Ala., serving in this capacity at various locations. He was appointed assistant track supervisor at Athens, Tenn., in January 1950, the position he held at the time of his recent promotion.

Robert C. Turnbell, who was recently appointed division engineer on the Nickel Plate at Ft. Wayne, Ind. (announced elsewhere in this issue), was born at Tipton, Ind. He was graduated from Purdue University in 1937 with a B.S. degree in civil engineering, later studying structural engineering at the John Huntington Polytechnic Institute in Cleveland. Upon graduation from Purdue, Mr. Turnbell joined the Nickel Plate as a junior draftsman at Frankfort, Ind., moving to Cleveland in 1940 as a draftsman. Subsequently he was appointed architectural engineer and assistant designing engineer there, and helped design Nickel Plate's modern engine terminals at Calumet, Ill., Belleview, Ohio, and East Wayne, Ind. In 1953, he was named special engineer at Cleveland, and in November 1955 he was made assistant engineer at the same location, the position he held at the time of his recent promotion.

Association News

Maintenance of Way Club of Chicago

The first meeting of the current season will be held at the Hamilton Hotel, Chicago, on October 27, with dinner being served at 6:30. The program will consist of a panel discussion of the subject, "Should frog and switch designs be standardized?" The consist of the panel was not available at the time of going to press.

Northwest Maintenance of Way Club

During the 1958-59 season, this club will continue to hold its monthly dinner meetings at the Midway Civic Club, 1931 University avenue, St. Paul, Minn. Dinner will, as usual, be served at 6:30 pm. The first meeting was held on September 25. At the second meeting, to be held on October 23, the speaker will be L. P. Zimmerman, commissioner of highways for the State of Minnesota, whose topic will be, "The Minnesota Interstate Highway Program."

Officers elected for new supply association

Final details involved in carrying out the merger of the Track Supply Association and the Bridge and Building Supply Association were completed at a joint meeting of the two associations at the Conrad Hilton Hotel, Chicago, on September 17. The new organization will be known as the Association of Track and Structure Suppliers.

The following officers were elected: President, A J. Reading, National Aluminate Corporation; first vice-president, Leo Flinn, Dearborn Chemical Company; second vice-president, Herbert Clark, Jr., Armco Drainage & Metal Products, Inc.; third vice-president, R. T. Johnson, Jr., Mid-West Forging & Manufacturing Co.; secretary, P. J. Wolf, Maintenance Equipment Company; treasurer, H. R. Deubel, Chicago Pneumatic Tool Company.

(*Continued on page* 64)

Association News (Cont'd)

Directors elected are: (to serve three years) J. L. Beven, Jr., Remington Arms Company, Inc.; M. H. Dick, *Railway Track and Structures;* and A. L. Fridley, Unit Rail Anchor Corporation; (to serve two years) F. W. Evinger, The Lehon Company; J. M. Giles, Caterpillar Tractor Company; and E. C. Gunther, Duff-Norton Company; (to serve 1 year) W. B. Blix, Nordberg Manufacturing Company; L. R. Gurley, Modern Railroads; and C. L. Rager, Fairmont Railway Motors, Inc. R. E. Mann, Modern Supply Company, was elected ex-officio director.

Immediately following the meeting, at which this action took place, the newly elected officers and directors of the new association held a brief meeting at which Lewis Thomas, Q & C Co., was elected executive secretary and assistant treasurer. It was also voted to hold the next meeting of the officers and directors on November 25.

The Track Supply Association and the Bridge and Building Supply Association will officially remain in existence until the close of their current fiscal year, Oct. 31.

American Railway Engineering Association

The Nominating committee met at the Conrad Hilton Hotel, Chicago, on September 15 under the direction of C. J. Geyer, chairman. Mr. Geyer is retired vice-president, construction and maintenance, of the Chesapeake & Ohio, and a past president of the association. The committee nominated F. R. Woolford, chief engineer, Western Pacific, as president. Mr. Woolford is now senior vice-president. R. H. Beeder, assistant chief engineer, system, Santa Fe, was nominated to the position of junior vice-president. E. J. Brown, chief engineer, Burlington Lines, now junior vice-president of the association, will automatically be advanced to senior vice-president.

At the time of going to press, acceptances had not been received from all those members nominated as directors and as members of the Nominating committee. Hence, it is not possible to announce these nominations at this time.

The next meeting of the Board of Direction will be held on November 7 at Urbana, Ill., on the campus of the University of Illinois. The purpose of holding the meeting at that location is to permit the board members to participate in the presentation of a bronze plaque to Herbert F. Moore, retired research professor of engineering materials at the University of Illinois. The plaque, to be mounted in Talbot Laboratory at the university, is being presented jointly by the AREA and the American Iron & Steel Institute in recognition of Professor Moore's "pioneering and pre-eminence" in the study of fatigue properties of materials and especially of his direction of the joint investigation of fissures in railroad rails. The presentation will be made at a luncheon to be held on November 7.

(*Continued on page* 66)

Association News (Cont'd)

A meeting of the General Convention Arrangements committee will be held at the Sherman Hotel, Chicago, on November 4, to make preliminary plans for the 1959 convention. The meeting will be held under the direction of J. A. Barnes, chairman, who is assistant to engineer maintenance of the Chicago & North Western.

Supply Trade News

AMERICAN CREOSOTING—This company, a subsidiary of **Union Bag-Camp Paper Corporation,** has announced the appointment of **W. R. Webb** as sales representative. A member of the company since 1957, Mr. Webb served most recently as assistant to the general superintendent. In his new capacity he will cover the St. Louis sales territory.

BUCYRUS-ERIE — The Depco Detroit Corp., Detroit, Mich., has been appointed distributor for this company's line of Hydrocranes, Hydrohoes and Hydroshovels. The territory covered includes that portion of Michigan east of and encompassing the following countries: Hillsdale, Jackson, Eaton, Clinton, Gratiot, Isabella, Clare, Roscommon, Crawford, Otsego and Cheboygan. Complete equipment parts and servicing facilities are maintained at the distributor's plant, 15721 Telegraph Road, Detroit.

INDUSTRIAL BROWNHOIST—Lawrence A. Reinhardt has been promoted to vice-president and controller of this company, Bay City, Mich., according to an announcement by **Donald Quick,** chairman of the Industrial Brownhoist board and president of American Steel & Pump Corp. Mr. Reinhardt, a native of Bay City, joined the former Industrial Works plant in 1920 as a cost clerk. He joined the estimating department in 1920 and moved to the accounting department in 1930. He was appointed auditor in 1934, assistant secretary in 1949 and became assistant secretary and assistant comptroller in 1954. Since 1957 he had served as assistant secretary and assistant treasurer.


L. A. Reinhardt
Brownhoist


W. H. Scheick
Teco

REMINGTON ARMS COMPANY—Chain saws and other portable gasoline, electric and air-powered tools, formerly made and sold under the name of this company's wholly owned subsidiary, **Mall Tool Company,** will now be made and sold under the Remington name at Park Forest, Ill., and Toronto, Ont., according to an announcement. The Canadian operation will be conducted under the name of **Remington Arms of Canada, Limited.** Mall Tool Company, as a separate corporate entity, was dissolved as of September 30, 1958. All the assets and obligations of Mall, including the company's Canadian subsidiary, Mall Tool Ltd., were assigned to Remington Arms Co., Inc.

THE ROY C. PATTON COMPANY—This company has announced the removal of its offices from Charlotte, N. C., to 3416 Silver Palm Road, Jacksonville Beach, Fla. The mail address is P. O. Box 171, Jacksonville Beach.

TIMBER ENGINEERING COMPANY — William H. Scheick has been appointed vice-president — research and development for this company, which is the research — engineering affiliate of the National Lumber Manufacturers Association. He succeeds **Carl A. Risholl** who will retire in a few months.

WESTERN INDUSTRIES, Inc. — This company has announced the transfer of its offices and plant to 2742 W. 36th Place, Chicago, effective, September 1.

ADVERTISERS IN THIS ISSUE

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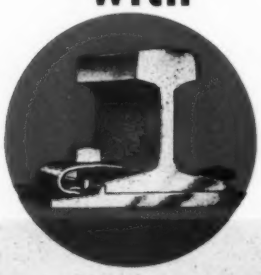

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